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The Art of Defamation

THE art of defamation is not new, in fact it is one of man's earliest accomplishments. The Children of Israel must have been conversant with it in the days of Moses; else why the commandment: "Thou shalt not bear false witness against thy neighbor?"

Like all ancient inventions which have survived to the present day, this art has been materially improved. Slander, in ancient days, was handicapped by having to travel by word of mouth. Today, thanks to the facilities of the printed word, of radio and of the motion picture, he who would appear whiter by blackening his neighbor finds the marvelous modern facilities for mass dissemination of misinformation available for his use.

The writer had the misfortune of having to sit recently through the showing of a mediocre moving picture entitled "The President Vanishes." The theme of this picture is that of a peace-loving President who goes to the extreme of getting himself kidnapped because a munitions cabal is attempting to force the country into war. The steel industry, typified by a steel "baron," the judiciary, typified by a judge, congress, as typified by a senator, a great newspaper publisher and other supposedly substantial members of our society are depicted as wolfish and unprincipled rascals who form the clique which is represented as selfishly forcing the President's hand.

So far as could be judged by an observer, the object of this picture, or at least its effect, was not so much that of condemning war as of arousing hatred of steel manufacturers, judges, newspaper publishers, congressmen and others who have had the temerity to achieve some degree of success and social distinction. One might have well wondered if the effort was not intended as a communistic coup d'état, the mission of which was to destroy military preparedness and social distinctions based upon achievement at one fell blow.

One might, perhaps, expect such melodramas with a mission of defamation from some of the haywire brains of Hollywood. One would **not**, however, expect to find it in the halls of congress.

We commend to our readers, therefore, a careful reading of the article which immediately follows this editorial. It is devoted to a common-sense analysis of the American "Munitions Trust" bugaboo, now being so prominently paraded by Senator Nye and his committee associates.

This article, too, has a mission. It is to expose the childish fallacies which underlie the latest defamation of American industry.

J. H. VanDeventer

Puncturing the A

By GEORGE W. ALCOCK

o o o

THE munitions inquiry, so called, that is being conducted by the investigating committee headed by Senator Nye is creating impressions that are both erroneous and damaging to public security. It is building in the minds of the public the belief that we were forced into the world war by the profit greed of a cabal of American "munition makers" who were Judases anxious to turn their brothers' blood into money.

Such accusations are not merely unfair; they are silly. If sponsored in good faith and not by a desire for the limelight which follows the successful efforts of sensation mongers, their conception denotes a moronic lack of understanding of both the material requirements of war and of the elements of industrial production.

Common sense is all that is necessary to demolish this canard.

Common sense, plus a first hand knowledge of industrial production both for the purposes of war and peace, is applied to this subject by the author of this article. We dedicate it to the industries which are being so unjustly maligned and to the public which is being so grossly misled.

American "Munition Trust" Bogey

o o o

DID American munition makers lead, force or cajole us into the World War? History answers that question unmistakably in the negative.

We were brought into the world war because Germany refused to recognize our rights on the high seas and torpedoed our ships carrying cargoes to Allied and neutral nations.

President Wilson, in protesting against any infringement of our rights on the high seas, simply lived up to his oath of office, and maintained our national traditions. That any cabal of steel makers, explosive manufacturers or other munitions interests influenced him is fallacious. To create any other impression is to grossly distort facts. We are not, and never have been, a nation of munition manufacturers, in the sense in which this term is used in Europe.

The plain truth is that it was primarily our farmers, and those engaged in processing the products of the soil who first involved us. Long before any munitions maker received an order from abroad, we had been exporting raw and processed products of the soil and farm. Wheat farmers, hog farmers, cotton farmers, sheep farmers, dairy farmers, lumber manufacturers, millers, tanners, woolen makers, cotton makers, automobile builders all benefited through stimulated exports of their goods long before a dollar's worth of powder, shell or cannon was purchased from any American maker. Horses and mules went over in huge quantities; shiploads at a time. Tobacco growers and cigarette makers sent over tons of their product months before any so-called munitions maker was able to secure a hearing from a foreign war office. Ford automobiles were sold to the Allied armies even though this helped prolong hostilities, and made it impossible to get the boys out of the trenches before Christmas.

There was nothing surreptitious or mysterious about this. Before an army can fight it must be trained and outfitted. Purchases of clothing and food, shoes and blankets always precede the purchase of munitions. If all those engaged in the peaceful fabrication of the products of the farm and soil had refused to sell their goods to the Allied armies, President Wilson would have been successful in his effort to keep us out of war. The Germans would have been in Paris and the war would have been over long before any American explosives or shells would have been purchased.

Napoleon, military genius of all time, and an outstanding organizer and administrator, recognized the necessity of an efficient commissary. Given command of the French army in Italy at a time when his government was bankrupt, its credit wrecked, and its army demoralized, he is reported to have told his men: "Soldiers, you are half starved and naked. The Government owes you much but can do nothing for you. Your patience, your courage do you honor, but give you no glory, no advantage. I will lead you into the most fertile plains in the world. There you will find flourishing cities, teeming provinces. There you will reap honor, glory and wealth." Perhaps Napoleon never made such a speech, but history records that after his first victory in Italy he assessed the territory

he had conquered, and used this money to outfit his army, give them new shoes, decent food, and thereafter the morale of his men was entirely changed.

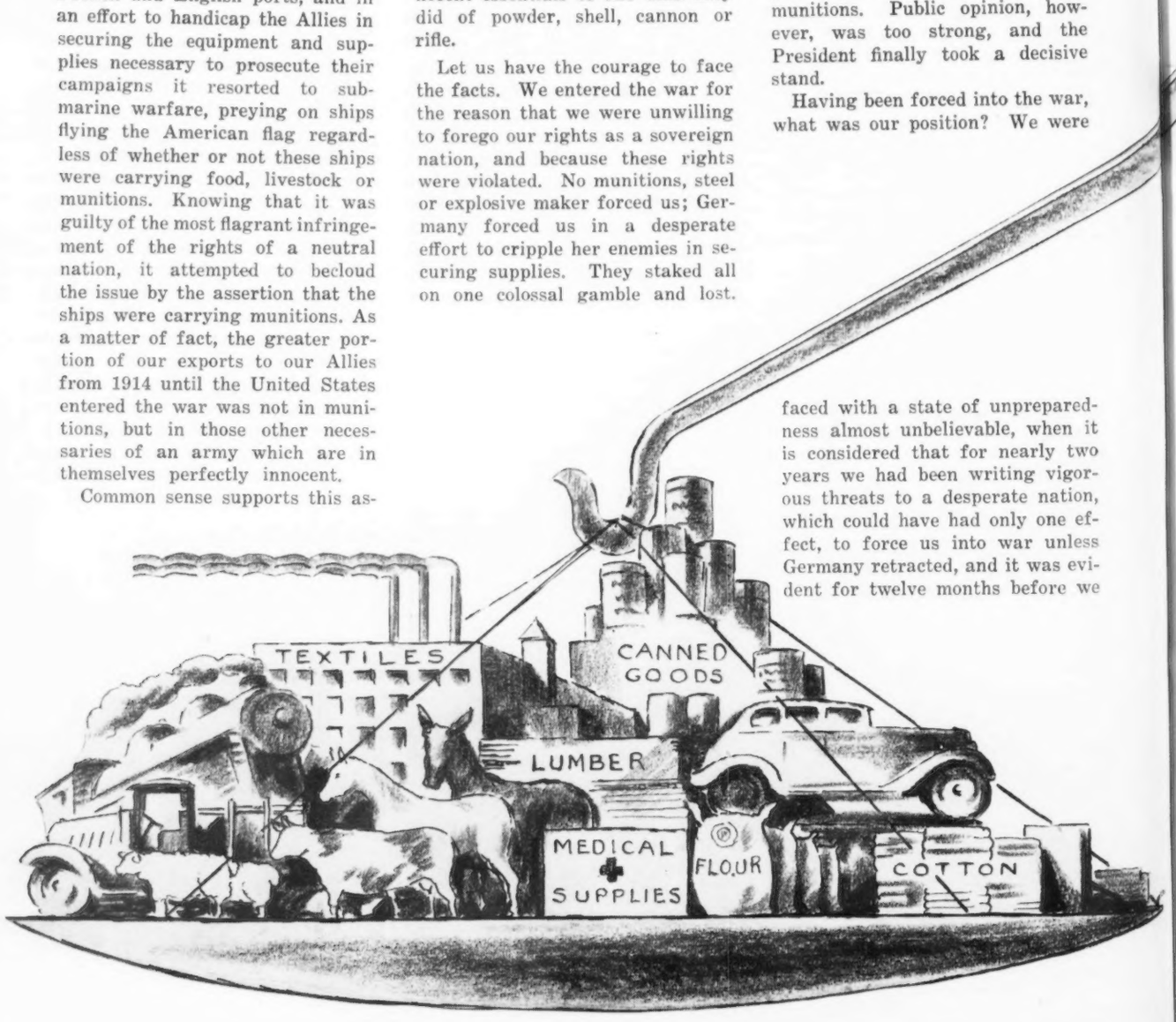
Peace Time Products, Not Munitions, Win Wars and Fight Them

After an army is recruited and outfitted, immense stocks of food, clothing, hospital supplies, and all the common necessities of life must be accumulated and stored at strategic points. There is no record that any of those who supplied these innocent things are being blamed for our entry into the war, but certainly, if the stand taken by the Nye Committee is sound, they and not the munitions makers should be censured.

Nothing is gained by bilking the truth. Germany was unable to maintain an effective blockade of French and English ports, and in an effort to handicap the Allies in securing the equipment and supplies necessary to prosecute their campaigns it resorted to submarine warfare, preying on ships flying the American flag regardless of whether or not these ships were carrying food, livestock or munitions. Knowing that it was guilty of the most flagrant infringement of the rights of a neutral nation, it attempted to becloud the issue by the assertion that the ships were carrying munitions. As a matter of fact, the greater portion of our exports to our Allies from 1914 until the United States entered the war was not in munitions, but in those other necessaries of an army which are in themselves perfectly innocent.

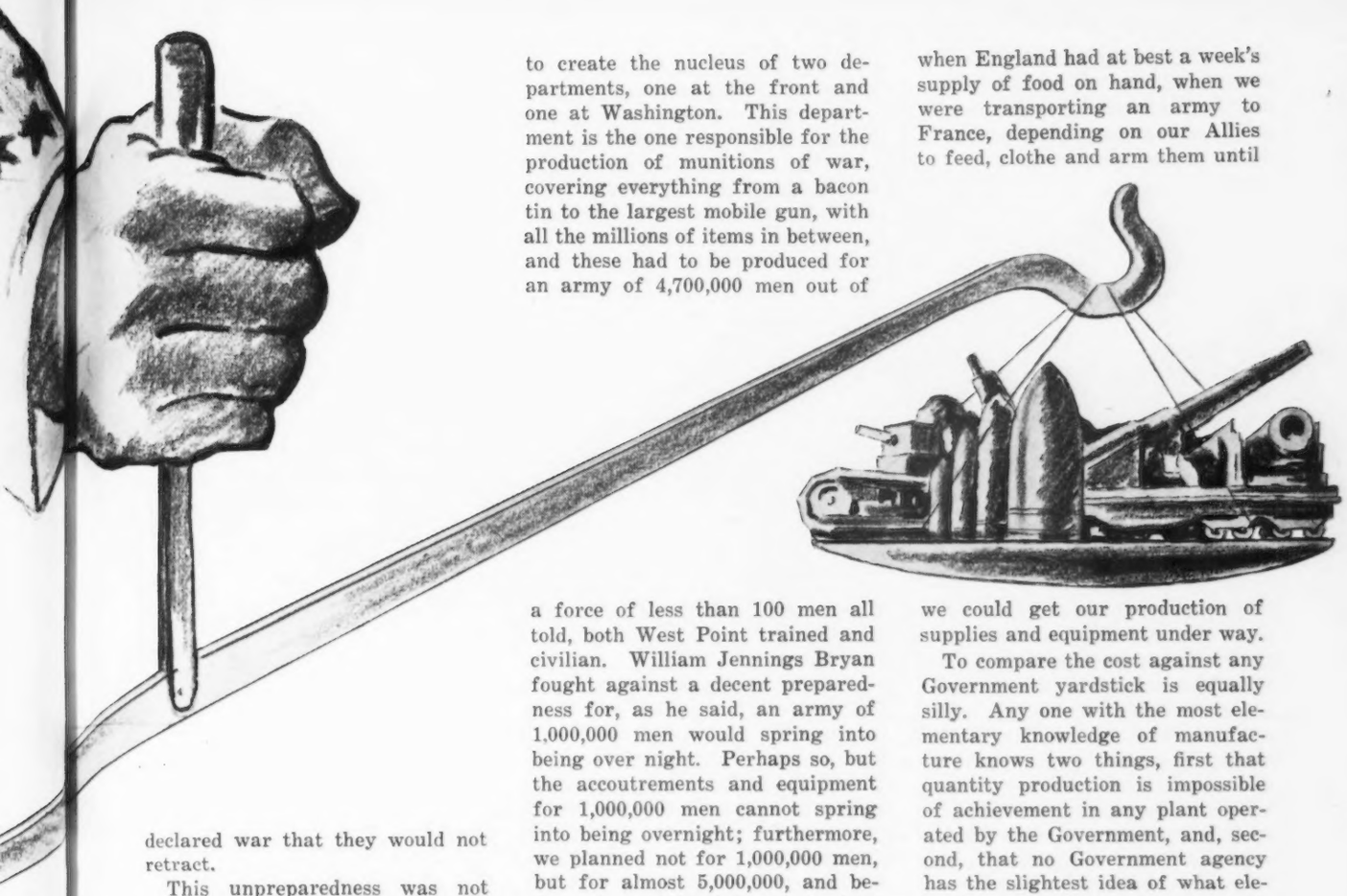
Common sense supports this assertion. Shipping was too scarce to be used carelessly, so in the very early stages of the war both England and France made an exhaustive survey of what could best be secured overseas. They could both manufacture guns and shells. For over a hundred years England had been making iron and steel products. Coal and iron are native to English soil. Foodstuffs, however, are not produced in sufficient quantity even in time of peace. Canadian mutton, Argentine beef, Australian butter, wheat from all three countries, citrus fruits, tea and vegetables all arrived in shiploads daily. During the war large quantities of wool, cotton, and food stuffs necessary for the maintenance of their army, of necessity came from overseas. England and France imported much larger quantities of those innocent essentials of life than they did of powder, shell, cannon or rifle.

Let us have the courage to face the facts. We entered the war for the reason that we were unwilling to forego our rights as a sovereign nation, and because these rights were violated. No munitions, steel or explosive maker forced us; Germany forced us in a desperate effort to cripple her enemies in securing supplies. They staked all on one colossal gamble and lost.



Had they been able to intimidate our avowed pacifist Secretary of State, we might have placed an embargo on the shipment of supplies, whether food, clothing or munitions. Public opinion, however, was too strong, and the President finally took a decisive stand.

Having been forced into the war, what was our position? We were faced with a state of unpreparedness almost unbelievable, when it is considered that for nearly two years we had been writing vigorous threats to a desperate nation, which could have had only one effect, to force us into war unless Germany retracted, and it was evident for twelve months before we



declared war that they would not retract.

This unpreparedness was not chargeable to lack of effort or ability on the part of the commissioned personnel of the War Department. It was a definite part of President Wilson's carefully considered policy. Almost to the last he sustained the hope that the belligerent nations would accept him as a mediator, and that he would be the Ambassador of Peace. This was so fixed as a part of his definite policy that, when General Pershing was appointed Commander in Chief of the American Expeditionary Force, he found, as he has stated in his "Experiences of the World War," *that there was no program of any kind.* Take the case of shipping alone; we knew that if we entered the war we would have to transport an army to France, yet no effort of any kind was made to establish a merchant marine until after war was declared, and then we had to depend on the Allies, as our ill-fated shipping program never really became effective.

When General Pershing sailed for France there was in the entire Ordnance Department of the United States Army a total of about 80 men, some of whom were almost at the retiring age. Out of this pitifully small force we had to create the nucleus of two departments, one at the front and one at Washington. This department is the one responsible for the production of munitions of war, covering everything from a bacon tin to the largest mobile gun, with all the millions of items in between, and these had to be produced for an army of 4,700,000 men out of a force of less than 100 men all told, both West Point trained and civilian. William Jennings Bryan fought against a decent preparedness for, as he said, an army of 1,000,000 men would spring into being over night. Perhaps so, but the accoutrements and equipment for 1,000,000 men cannot spring into being overnight; furthermore, we planned not for 1,000,000 men, but for almost 5,000,000, and before they could fight we had to get them to France.

Munition Profit Possibilities Were Non-Existent

Had there been a munitions clique forcing us into war, it stands to reason that there would have been unlimited capacity available for the production of munitions when war was finally declared, but exactly the reverse was the case. Before General Pershing's requirements could be met, it was necessary to create facilities for the production of practically every item in the Army Ordnance program. No peace-time Government could be expanded with sufficient rapidity to accomplishment this. Industry had to be depended upon to provide the facilities, and these facilities were largely provided by manufacturers who had had no previous experience in producing ordnance. It is one thing to sit in a Committee room in Washington 17 years after hostilities have ceased, and ruminate as to how munitions should have been produced, but it was another thing for those charged with meeting General Pershing's program, to secure this production when the German long range guns were bombarding Paris, when England had at best a week's supply of food on hand, when we were transporting an army to France, depending on our Allies to feed, clothe and arm them until we could get our production of supplies and equipment under way.

To compare the cost against any Government yardstick is equally silly. Any one with the most elementary knowledge of manufacture knows two things, first that quantity production is impossible of achievement in any plant operated by the Government, and, second, that no Government agency has the slightest idea of what elements properly constitute cost. This is neither hearsay nor heresy. It is clearly brought out in the very admirable report of the Congressional committee appointed to investigate Government competition with private enterprise, of which the Hon. Joseph B. Shannon of Missouri was chairman. This committee had this to say on Government cost accounting: "The committee recommends that the Government departments and agencies be required by the Congress to install and maintain a uniform system of accounting, containing all the elements of cost finding, which the best practice has sanctioned for public utilities, and private industrial and commercial enterprise.

"The Committee believes that the results of such a system of accounting would be invaluable to Congress in considering appropriations for public works and similar projects, as well as in considering proposals for the continuance and maintenance of existing Government departments, and business activities, and in passing upon new undertakings which may be submitted for Congressional action.

"The establishment of such Governmental accounting methods will

also make possible a comparison between public and private costs of production and of service."

Government Not Anxious to Know the Production Costs

Unfortunately a bill introduced by Congressman Shannon in Congress to make this recommendation effective has so far failed of passage, on account of opposition from all the Government departments.

With such an arraignment of Government cost finding methods, is it not, to say the least, unfair to indict industry for excessive cost as compared with any hypothetical estimate of the cost of production in Government plants?

Acting Chief of Ordnance Pierce, in testifying before a Congressional Sub-committee on Nov. 28, 1922, stated, and this is taken from the Shannon report:

"Military overhead at the six manufacturing arsenals of the Ordnance Department as computed on Jan. 25, 1916, is as follows:

Frankford Arsenal 12 per cent
Rock Island Arsenal 13.77 per cent
Springfield Armory 16.15 per cent
Watertown Arsenal 18.66 per cent
Watervliet Arsenal 21.51 per cent
Pictatinny Arsenal 22.03 per cent"

General Pierce admitted that these figures did not include all the items which are ordinarily included in a cost estimate, War Department administration for instance being included at 3.5 per cent. Can any manufacturer imagine operating a plant of the size and with the expensive equipment necessary to produce explosives or heavy ordnance at the overhead figures given?

Let the members of the Nye committee read the speech of the Hon. Robert F. Rich of Pennsylvania in the House of Representatives June 15, 1934, on the subject of Government cost. He said, speaking of the investigations of the Shannon committee of which he was a member:

Using an Eighteen-Inch Yardstick

"The investigations of our committee disclosed very clearly that by virtue of the manner in which accounts are kept in public establishments, by frequently including in costs only direct charges for material and labor, all the other costs which actually entered into the operations of the Government establishment were ignored. Thus, the Government underbid its citizens by proceeding as though all other elements of cost which were actually present were not there. It went further. If the Government establishment suffered a capital loss, Congress replaced the establishment, and the capital loss never appeared against the future product. Or a single establishment charges many of the elements of its cost to appropriations other than the one under which it directly operates a particular project, and thus escapes those elements of cost carried by another board, bureau or department."

Is it on the basis of cost findings of this kind that industry is to be crucified by a notoriety seeking committee? It is no disclosure of Government secrets to state that at no time was the War Department able to fulfill General Pershing's requirements for his campaign of 1918, even had the estimated production been realized. If the productive capacity of the country had been susceptible of expansion sufficiently rapid to permit of doubling our shipments during 1918, what would have been the measure of the cost? Would it have been a fictitious figure prepared by some Government arsenal on the basis of hypothetical figures for overhead such as General Pierce produced before the Congressional subcommittee on Nov. 28, 1922, or would the cost have been analyzed on the basis of its effect in ending the war. Had we been able, by the expenditure of *any* sum, to increase our production of the necessities of war, it is certain that President Wilson, and his secretaries Baker and Daniels, would have felt the expense well worth while, if it brought the end of the war only a single day nearer.

Again, much of the high cost of munitions was due entirely to Governmental policy, and lack of unanimity of opinion in the high command, but certainly these things are not chargeable to industry. It is common knowledge that there was a marked difference in the views of General Pershing at the front, and General March, Chief of Staff, at Washington. President Wilson also enunciated the policy of maintaining national identity for the American Army. Insignificant as these things may seem, they had tremendous influence on the cost of production.

Army men deplored the delay in securing detail plans of the ordnance finally adopted for our Expeditionary Force. These plans would have been cheerfully placed at our disposal by France months before we entered the war, so that, in the event we were finally forced to throw in our lot with them we would be ready to go into production. This was so directly opposed to President Wilson's policy, however, that nothing whatever was done until after hostilities were started.

Although American manufacturers were manufacturing machine guns for practically all of the Allied nations, one of them being the invention of an American Army officer, and these machine guns were in successful use on all the fighting fronts, none of them was considered good enough for American troops, and after war was declared we undertook to put into production an entirely new machine gun—the Browning. To tool up factories and put an intricate piece of mechanism of this kind into quantity production before it has been subjected to elaborate field tests is an extremely hazardous venture. The natural result was endless delay and unnecessary cost, for which industry now is blamed.

In April, 1917, our standard army rifle was the Springfield of 1903, and there were less than 300,000 of these available. It was, however, considered obsolete. The British Enfield was in production in private plants and this was adopted, but modifications were made to use the American bullet, with the usual corollary of delay and expense.

Trench warfare had its inception on a small scale in General Grant's campaign before Petersburg, over 50 years before we entered the war. We should have known that the war in which we had elected to engage was being waged largely in trenches, and that all the Allied troops, and those of the enemy were equipped with trench helmets. This information could have been secured from the public press months before we entered the war. When we did declare war we not only had no facilities for the production of trench helmets, but the very shape itself was not decided upon until months after we had started the embarkation of troops.

Gas warfare and aerial warfare were entirely new to us. We not

only had no equipment for these branches of service, but we had no idea of what equipment was required. All of this had to be evolved after General Pershing reached France.

When we entered the war our standard field gun was the 4.7 used in the Spanish-American War. An entirely new line of artillery was put into production, including the 37 mm., 75 mm., 155 mm. gun and howitzer, anti-aircraft guns and trench mortars. These guns, the shells, cartridge cases, loading bags, fuses, boosters and adapters, gun carriages, caissons and limbers were all strange to American plants.

The Munitions "Clique" Idea is Exploded by Facts

The tremendous task of creating plant capacity, securing machinery and tooling up shops for new designs of ordnance, in the quantities required by General Pershing's plans for a combat army of almost 5,000,000 men, was heartbreaking, when the conditions under which the work had to be undertaken is considered. Cost, of course, was high. How could it be otherwise? But the fault does not lie with industry. Can anyone seriously contend that there was a munitions clique forcing us into war, but yet so inefficient that not even the slightest semblance of a program had been evolved before we declared war? Our tragic unpreparedness, now a matter of historical fact, is the absolute refutation of the assertion that any group of steel makers, munitions makers or explosive makers ever made any effort to influence the Administration. If any further refutation is needed look at the manufacturers who contributed most to the production of ordnance. Mostly peaceful factories who had never before had any experience in the production of ordnance.

Instances such as the above could be adduced ad infinitum. They are the inevitable experience of a peaceful people turned to war. The years 1914 to 1917 changed the whole aspect of war, but we had for our standard the equipment of 1898. The fact that our War Department had to undertake these heartbreaking developments after hostilities were started and troops were waiting for equipment naturally increased cost. Anyone familiar with the conditions which existed in 1918 will testify to plants tooled up for production, waiting weeks and sometimes months for decisions on vital points. Confusion as to program, as to design, explosive and propelling powders are matters of common knowledge.

GEORGE W. ALCOCK

Government Had the Power to Commandeer Private Plants

Perhaps it is now felt that better results would be obtained in the future if the Government should commandeer plants over and undertake the work of production. It is significant that it had absolute power to do this in 1917 and 1918, but it was exercised only in rare cases, and then with disastrous effects as far as increased production was concerned. It is easy to stop the wheels of a plant from turning, but it is another to start them again. Those manufacturers who took contracts based on the Government supplying them with material can well remember the days, weeks and months their plants were either totally idle or working at much reduced capacity waiting for the Government agencies to function.

An absolute lack of raw materials, and the development of substitutes or new sources of supply, also caused endless expense. Mr. Baruch has pointed out to the Nye Committee our lack of tin. In the latter part of 1917 precision glass was a matter of grave concern. Precision glass was not then one of our accomplishments. The days when batteries were trained by sight on bodies of massed troops went out with the Civil War. We knew guns trained by range finders on unseen foes required accurate gun sights, but we still depended on Germany for glass, and unfortunately that supply was cut off. After war was declared we had to learn to make precision glass, a painfully slow and expensive process, as the records of the Bureau of Standards will show. We learn slowly, however, as the public press recently stated that notwithstanding Mr. Baruch's suggestion no steps would be taken to create a supply of tin at this time, as that would give the impression that we were preparing for war.

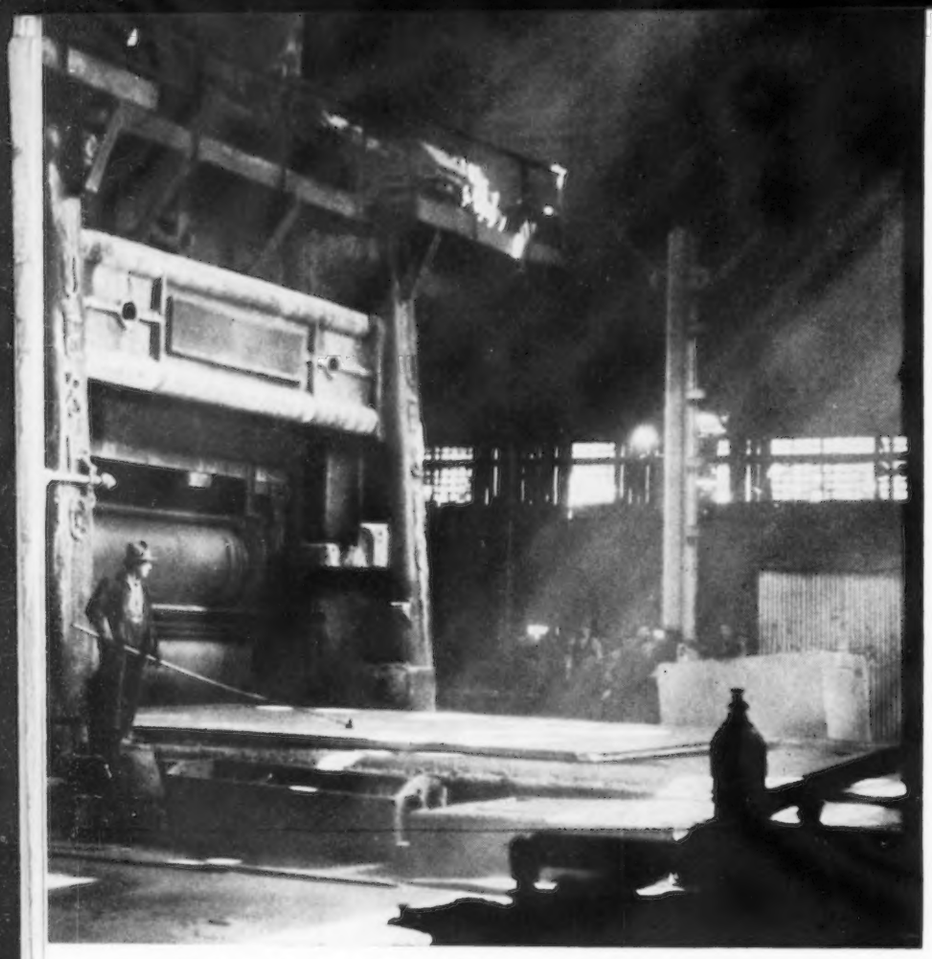
Surely the monument at Muscle Shoals should make taxpayers shudder at the thought of leaving to the Government the creation of facilities for the production of munitions. This was the Government's contribution to the supply of nitrates, and the Nye Committee might well investigate the cost of this portion of the explosive program.

Let it be written into the record of this committee that if we had had to depend on the Government forces to produce the facilities for the manufacture of the things necessary to wage war, to feed, clothe and equip an army of five million men, these facilities would never have been created, regardless of cost, and never will be created by Government forces in any similar emergency in the future. A task huge enough in itself was, and will be, to formulate the program to be met, and to American industry was, and must be left the task of carrying on from there. Let it further be written into the record that American business will not be found lacking in either patriotism, energy or ability.

War Would Tax Our Entire Production Capacity

No country such as ours can ever be expected to have capacity for equipping a combat army without calling on the entire productive capacity of the country. To think otherwise is futile. The day of small armies is past and gone. Any war in the future will be waged with enormous forces on land, sea and air. To create the facilities required to equip such forces in a republic such as ours

(CONCLUDED ON PAGE 54)



Nickel-clad plate being rolled on the world's largest plate mill.

Manufacture

THE method of joining nickel and steel described in this article is that developed by the Lukens Steel Co., and the International Nickel Co. The product, nickel-clad steel, is used principally where protection against corrosion is desired in combination with the economy of plain steel.

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MANUFACTURE of nickel-clad steel at the plant of Lukens Steel Co., Coatesville, Pa., starts with a bloom of flange quality steel and an 8000-lb. slab of pure nickel. Pure nickel and steel have practically the same coefficient of expansion under heat and this not only is an advantage in the production of nickel-clad plates but also prevents strains in the material when used under conditions of expansion and contraction in service. The usual proportion of thickness of nickel to steel in the clad plate is 1 to 9, although cladding may range from 5 per cent nickel on heavier plates to 40 per cent as in the case of ice cream freezer shells where the inside surface is machined after the shell is rolled up and welded.

Assuming that the usual 1 to 9 ratio is to prevail, and that the initial thickness of nickel is to be ¼ in., then the steel bloom is prepared for bonding by rolling to a thickness of 2¼ in., trimming to approximate size with the gas torch, and carefully flattening in a flattening press. After this the surface which is to be bonded with the nickel is sand blasted with a fine iron powder blast.

This blast cleaning is an important part of the process. It is done in a modern sand blast room with adequate exhaust and with specially prepared clean abrasive. The nickel up to this point follows through a sequence of operations similar to that of the steel. That is, the slab is rolled down to the desired thickness, ¼ in., and is then trimmed under shears, flattened in a press, and one surface is abrasive blasted much as in the case of steel. Both blast operations are carried on simultaneously, or as nearly so as possible, and the two plates which are to be bonded are placed in contact immediately afterwards so as to reduce to a minimum any tendency toward oxidation or the introduction of foreign gases.

Two pairs of plates are rolled together, that is, two steel plates and two nickel plates, the steel being on the outside and the nickel on the inside, with a parting compound between the two nickel plates. To facilitate sealing of this assembly by welding, the steel is left extending a short distance, perhaps ½ in., beyond the nickel on all edges. It is this method of sealed assembly rolling which has spelled success for the process, as in this way the nickel is protected throughout the rolling and bonding procedure.

Method of Rolling

The assembly of four plates for rolling is usually built up as follows: The first steel plate, which frequently is 5 ft. square, is placed on a supporting table with its cleaned surface up, the table being of such a height that the edges of the plates are in a convenient position for welding. On top of this steel plate is then placed the first nickel plate with its cleaned surface in contact with the steel. Then comes the parting paste, followed by the second nickel plate with its sanded surface upward, and, in turn, by the second steel plate with its sanded surface against the nickel to complete the assembly. These plates, as stated,

and Some Uses of Nickel-Clad Steel

BY HERBERT R. SIMONDS

o o o

are all set in place immediately after the sanding has been completed. The projecting edges of the steel plates then are quickly welded together across the edges of the nickel plates so as to completely seal the nickel. A cross-section of this assembly of four plates is shown in the accompanying sketch.

As may be supposed, the discovery of a suitable parting paste was one of the most important steps in the development of the whole Lukens cladding process. Its final composition came only after long and difficult research work and its exact character is one of the company's trade formulae. The demands of such a parting material are rigorous. It must resist the high heat required for the bonding and rolling of the plates. It must spread evenly and thoroughly between the two nickel plates during the rolling, because otherwise the plates will come in contact and will bond together, necessitating scrapping of the entire plate combination. Also, the parting material must be easily removable after rolling and after the two sections are separated. And of course it must not in any way injure the surface of the nickel or create pressure which would destroy the sealing weld.

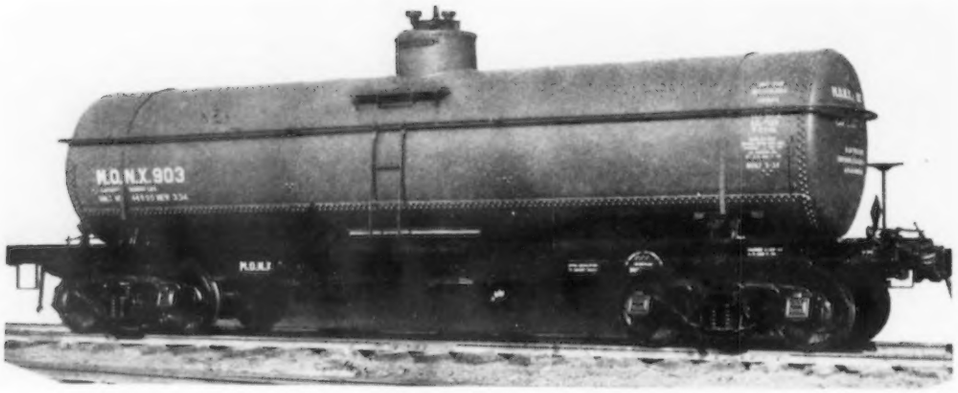
This welding is done electrically, using a steel welding rod of approximately the same composition as the steel in the plates. The welding is done chiefly to keep gases away from the nickel at the time of high temperature, the nickel being very sensitive to sulphur at the 2300 to 2400 deg. F. required for bonding.

After welding, the assembly is placed in a furnace and brought slowly up to 2400 deg. It is then transferred quickly to the rolls, so that the first pass will occur at a temperature above 2300. It is this first pass which creates the bond between the nickel and the steel, and subsequent rolling is merely to reduce the bonded plates to the desired thickness. In fact, subsequent rolling operations follow in exactly the same manner as would be the case with a solid steel plate of the same dimensions. After once having secured a bond between the nickel and the steel, rolling may continue until any desired thickness of plate is secured, the proportion of 1 to 9 remaining constant.

After rolling has been completed, the plate is trimmed on four sides, usually under shears, and the two parts are then sepa-

o o o

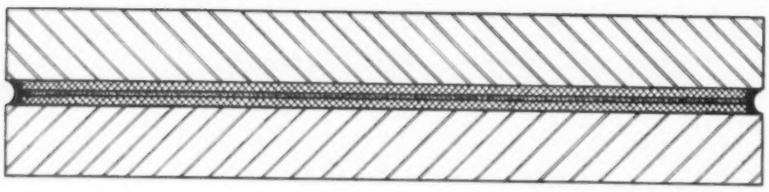
CONSTRUCTION of a 15-ft. diameter, 29-ft. deep nickel-clad steel soap boiling kettle at the plant of a large soap manufacturer. The joints are welded and fittings are made of pure nickel.



o o o

THIS shows one of two 8000-gal. tank cars built of nickel-clad steel by the American Car & Foundry Co.

o o o



SECTION SHOWING ARRANGEMENT OF METALS BEFORE ROLLING NICKEL-CLAD PLATES

STEEL NICKEL PARTING COMPOUND

THIS shows the method of building up sections of steel and nickel for bonding and rolling. Two-bi-metal plates are produced at one rolling and the two are then separated along the central parting line. As indicated, the assembly consists of a steel plate, then a nickel plate in close contact, then a parting compound, then a second nickel plate, and finally a second steel plate in close contact. The steel plates project beyond the nickel and the whole assembly is sealed by welding across the edges from one steel plate to the other.

AT LEFT

A STRIP of nickel-clad plate that has been twisted to test the bond between the nickel and the steel.

rated. The power shear at the Lukens plant has a capacity for cold cutting plate up to 2 in. thick and 200 in. wide. Above these dimensions the gas torch or rotary saws are used. The trimming of the two pairs of clad plates removes the weld around the edge and leaves the two bonded pairs of plates free for separation which is done by means of wooden wedges. After this, the parting material is washed off and the plate is inspected and trimmed to final size ready for shipping. Part of the inspection includes tapping with a small hammer to determine the closeness of adherence of the nickel to the steel.

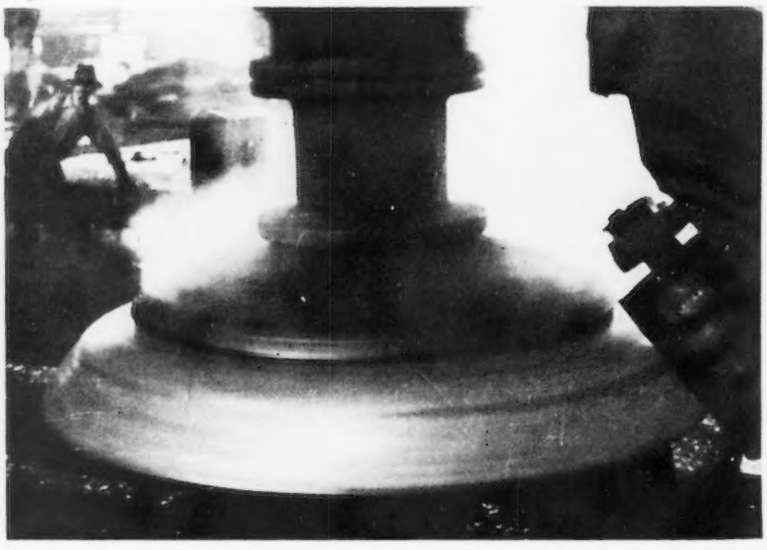
The largest nickel-clad plate so far produced at the Lukens plant was one 170 in. wide, 240 in. long, and ½ in. thick, made for one of the largest heavy chemical producers.

The nature of the bond between the nickel and the steel is not accurately known. Section specimens when polished always show a clear line of demarcation between the two metals, but engineers of the Lukens company state that having once secured a good bond in this way they have never known of the two plates separating, no matter how severe subsequent drawing

o o o

AT RIGHT

IN the construction of large tank heads the plates are trimmed to circular disks of required diameter and then are spun over to approximate form on this heavy spinning machine. The position of the roller at the right, which does the forming, is controlled by the operator. The size of the machine may be judged by the man in the background.



and forming operations may have been. The tensile strength of a clad sheet is somewhat greater than that of a steel plate of the same overall thickness. In tests using identical steel, unclad and clad, with the clad specimens having 10 per cent nickel, the yield point for the steel alone averaged 42,200 and for the bimetal plate, 45,600 per sq. in.

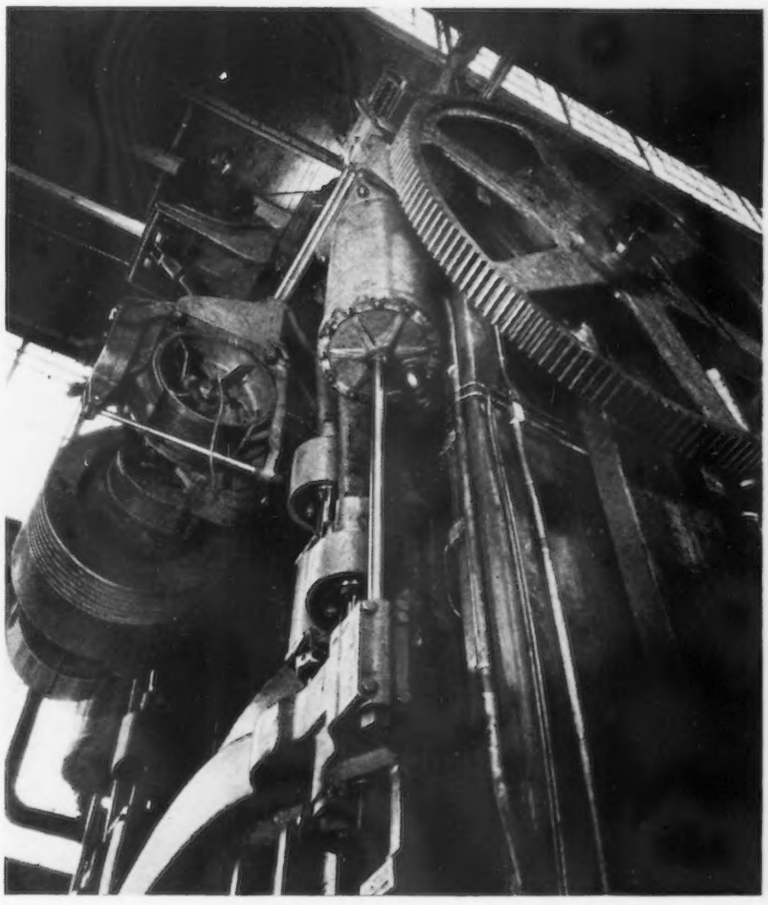
Use in Diverse Industries

In April, 1932, the New York Central put into service a locomotive equipped with a nickel-clad steel fire-box. This locomotive and its fire-box were thoroughly tested and found to be in perfect condition in November, 1934, after the engine had made 215,000 miles. Thus a two-year life seemed assured. Records of the life of standard steel fire-boxes in exactly similar service show an average of about one year before replacement is necessary.

The list of uses of nickel-clad steel is constantly growing. In seven colleges of Yale University nickel-clad steel drinking water storage tanks are in service. Die tanks in the textile industry, varnish kettles, nitriding ovens, industrial storage water heaters, and settling tanks are typical instances where nickel-clad steel is proving valuable. In the case of vacuum tanks the use of nickel-clad plate has made certain types of construction possible for the first time, as steel tanks with non-clad protective linings often proved unsatisfactory due to the collapsing of the linings. In the paper industry it is often important on high grade stock to keep every trace of iron out of the alum and size tanks and this is frequently done by using nickel-clad tanks with pure nickel pipes and fittings.

Tank trucks employing nickel-clad steel are coming into popularity for holding benzol, sugar, syrup, etc. Mixers, evaporators, and boiling kettles in the soap industry are other applications. Some of this apparatus when made with the bi-metal plate is said to be several times as expensive as the plain steel, but the added life and freedom from impurities make this advance in price warranted.

In the chemical industry bleaching tanks for fatty acids and storage tanks for caustics are frequently made of nickel-clad plate. In one of the new alkali plants, more than 400,000 lb. of nickel-clad was used for equipment. In the manufacture of plastics bi-metal tanks are used for processing kettles and nickel-clad tanks for storing and transporting phenol are coming into use. Other typical applications of nickel-clad in handling chemicals are mixing tanks for caustic soda and sodium carbonate used in manufacturing tri-sodium phosphate, storage tanks for high grade gelatine used in photographic work, tanks to secure purity in the manufacture of viscose rayon, and much apparatus for research work in organic chemistry.



THIS rather unusual view of an unusual drawing and forming press might be entitled "looking up." It is installed in one of the Detroit plants of Fisher Body and helps to make the new "turret top" for enclosed automobile bodies. A detailed description of this and other presses and processes used for this work appeared in The Iron Age of Jan. 17.

Welded vs. Cast Iron Jigs

THE building of jigs and fixtures by electrically welding fabricated steel, has proved after five years of use to have advantages over the cast iron body type.

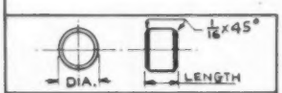
The most important advantage of the method is the saving in the initial cost of the tools, which ranges from 20 to 30 per cent, and in some cases as high as 50 per cent. As a general rule, the larger, or the more complicated the jigs or fixtures, the greater the saving.

The pattern shop and the foundry are eliminated when this method is used, and therefore delays from these sources are avoided.

The equipment required consists of a pantograph type oxy-acetylene cutting machine, with a radius attachment for circular work, an electric arc welder and a square surface plate with machined T-slots in both directions. The surface plate and a series of 90-deg. knees, strap clamps, T-slot bolts and

BOILER PLATE
.20 CARBON

THICKNESS	WIDTH	LENGTH
3/8	36	96
1/2	36	96
5/8	36	96
3/4	36	96
7/8	36	96
1	36	96
1 1/4	36	96
1 1/2	36	96



STD. BLANK JIG BOSSES
S.A.E. X-1315

DIA.	LENGTH				
1	5/16	7/16	5/8		
1 1/4	5/16	7/16	5/8		
1 1/2	7/16	9/16	3/4		
1 3/4	7/16	9/16	3/4	1	
2	7/16	9/16	3/4	1	
2 1/4	7/16	9/16	3/4	1	
2 1/2	9/16	3/4	1	1 1/2	
2 3/4	9/16	3/4	1	1 1/2	
3	9/16	3/4	1	1 1/2	
3 1/2	9/16	3/4	1	1 1/2	

ROUND COLD DRAWN
S.A.E. X-1315

3/32	3/4	1 13/16	3 5/8
1/8	49/64	1 7/8	3 3/4
5/32	13/16	2	4
3/16	7/8	2 1/8	4 1/8
7/32	15/16	2 3/16	4 1/4
1/4	1	2 1/4	4 3/8
5/16	1 1/16	2 5/16	4 1/2
11/32	1 1/8	2 3/8	4 3/4
3/8	1 3/16	2 1/2	4 7/8
7/16	1 1/4	2 5/8	5
29/64	1 5/16	2 11/16	5 1/4
1/2	1 3/8	2 3/4	5 3/4
33/64	1 7/16	2 7/8	
9/16	1 1/2	3	
37/64	1 9/16	3 1/8	
5/8	1 5/8	3 1/4	
41/64	1 11/16	3 3/8	
11/16	1 3/4	3 1/2	

S.A.E. 1020 HOT ROLLED

1/2	1 3/4	3 3/8	6 1/4
5/8	1 7/8	3 1/2	6 1/2
3/4	2	3 3/4	6 3/4
7/8	2 1/8	4	7
1	2 1/4	4 1/4	7 1/4
1 1/8	2 3/8	4 1/2	7 1/2
1 1/4	2 1/2	5	
1 3/8	2 5/8	5 1/4	
1 1/2	3	5 1/2	
1 5/8	3 1/8	5 3/4	
1 11/16	3 1/4	6	

SQUARE COLD DRAWN
S.A.E. X-1315

1/8	2
3/16	
1/4	
5/16	
3/8	
7/16	
1/2	
9/16	
5/8	
11/16	
3/4	
7/8	
1	
1 1/4	
1 3/8	
1 1/2	
1 3/4	
1 7/8	

S.A.E-1020 HOT ROLLED

3/4	3 1/2
7/8	
1	
1 1/8	
1 3/8	
1 5/8	
1 3/4	
2	
2 1/4	
2 1/2	
3	

RECTANGULAR
S.A.E. 1020 COLD DRAWN

1/8 x 3/4	1/4 x 1 5/8	1/2 x 5/8	3/4 x 1 1/2	1 1/4 x 1 1/2
1/8 x 7/8	1/4 x 2 3/4	1/2 x 1	3/4 x 1 3/4	1 1/4 x 1 3/4
1/8 x 1	5/16 x 7/16	1/2 x 1 1/8	3/4 x 2	1 1/4 x 2
1/8 x 1 1/4	5/16 x 5/8	1/2 x 1 1/4	3/4 x 2 1/4	1 1/4 x 2 1/4
1/8 x 1 1/2	3/8 x 7/16	1/2 x 1 1/2	3/4 x 2 1/2	1 1/4 x 2 1/2
3/16 x 5/16	3/8 x 1/2	1/2 x 1 3/4	3/4 x 2 3/4	1 1/2 x 1 3/4
3/16 x 3/8	3/8 x 3/4	1/2 x 2	7/8 x 1 1/4	1 1/2 x 2
3/16 x 3/4	3/8 x 1	1/2 x 2 1/2	7/8 x 1 1/2	1 1/2 x 2 1/4
3/16 x 1 1/4	3/8 x 1 1/4	1/2 x 3	7/8 x 1 3/4	1 1/2 x 3
3/16 x 2 1/4	3/8 x 1 1/2	1/2 x 3 1/2	7/8 x 2	1 5/8 x 2 1/4
3/16 x 2 3/4	3/8 x 1 3/4	5/8 x 1	7/8 x 2 1/4	1 3/4 x 2
3/16 x 3	3/8 x 2	5/8 x 1 3/8	7/8 x 2 1/2	
1/4 x 3/8	3/8 x 2 1/4	5/8 x 1 1/2	7/8 x 2 3/4	
1/4 x 1/2	3/8 x 2 1/2	5/8 x 1 3/4	1 x 1 1/4	
1/4 x 5/8	3/8 x 2 3/4	5/8 x 2	1 x 1 1/2	
1/4 x 3/4	3/8 x 4	5/8 x 2 1/4	1 x 1 3/4	
1/4 x 1	7/16 x 1	5/8 x 2 1/2	1 x 2	
1/4 x 1 1/4	7/16 x 2	5/8 x 4	1 x 2 1/2	
1/4 x 1 1/2	1/2 x 9/16	3/4 x 1 1/4	1 x 3	

S.A.E. 1020 HOT ROLLED.

3/8 x 3/4	1/2 x 7/8	5/8 x 1 3/4	3/4 x 2 3/4	1 1/4 x 3
3/8 x 1	1/2 x 1 1/4	5/8 x 2	3/4 x 3	1 1/2 x 2
3/8 x 1 1/4	1/2 x 1 1/2	5/8 x 2 1/2	3/4 x 4	2 x 2 1/2
3/8 x 1 1/2	1/2 x 1 3/4	5/8 x 4	1 x 1 1/4	2 x 3
3/8 x 1 3/4	1/2 x 2	3/4 x 1 1/4	1 x 1 1/2	2 x 4
3/8 x 2	1/2 x 3	3/4 x 1 1/2	1 x 2	2 1/2 x 3
3/8 x 3	1/2 x 4	3/4 x 1 3/4	1 x 2 1/2	2 1/2 x 4 1/2
3/8 x 4	5/8 x 7/8	3/4 x 2	1 x 3	
7/16 x 1 1/2	5/8 x 1 1/4	3/4 x 2 1/4	1 x 3 1/2	
7/16 x 2	5/8 x 1 1/2	3/4 x 2 1/2	1 x 4	

GENERAL NOTES:
WHEN ABOVE BAR SIZES DO NOT COVER DETAIL PARTS, SAME SHOULD BE BURNED FROM BOILER PLATE.
USE HOT ROLLED ST. WHEREVER POSSIBLE - COLD ROLLED ONLY WHERE SIZE REQD. IS NOT LISTED IN HOT ROLLED.
USE STANDARD JIG BOSSES WHEREVER POSSIBLE.
FOR SPECIAL BOSSES (WHICH ARE TO BE BORED OR TAPPED) USE X-1315 FREE MACHINING STEEL.

STOCK MATERIAL TO BE USED IN WELDED JIGS & FIXTURES

THE WARNER & SWASEY CO. DR. BY - F.V.K. APPR. BY - [signature] OCT.-18-1930 FOLIO D-61844

SHOP TOOL DESIGN STANDARDS SHEET No 3

and Fixtures

BY GEORGE L. KLUTER
The Warner & Swasey Co., Cleveland

C-clamps are indispensable, inasmuch as setting up to tack-weld the parts consumes a large portion of the welder's time.

Data Sheets Essential

The average tool designer furnished with a set of data sheets showing the bar stock and boiler plate sizes at hand and also standard welded joints to be used can readily adapt himself to this method of designing.

The data sheet shown in Fig. 1 contains a complete list of square and rectangular bar sizes, both hot and cold finished, several thicknesses of boiler plate and also standard jig bosses. At the Warner & Swasey Co. this stock is kept on hand at all times and will fill the requirements for all jigs and fixtures, as well as many other parts that are fabricated. Parts beyond the range of bar sizes, or of irregular shape, are burned out of boiler plate.

The data sheet shown in Fig. 2 illustrates the standard welded joints to be used. These joints are all very simple, and with but very few exceptions cover the requirements of jig and fixture design.

The saving in welded jig construction starts in the tool design department. The designer can build up a jig or fixture more rapidly with steel blocks and plates because the worries of coring and strength of overhanging lugs and close clearance due to draft on castings are eliminated.

The wall sections and ribs can be cut down from 25 to 50 per cent of those required for cast iron, thereby making the jig lighter and smaller.

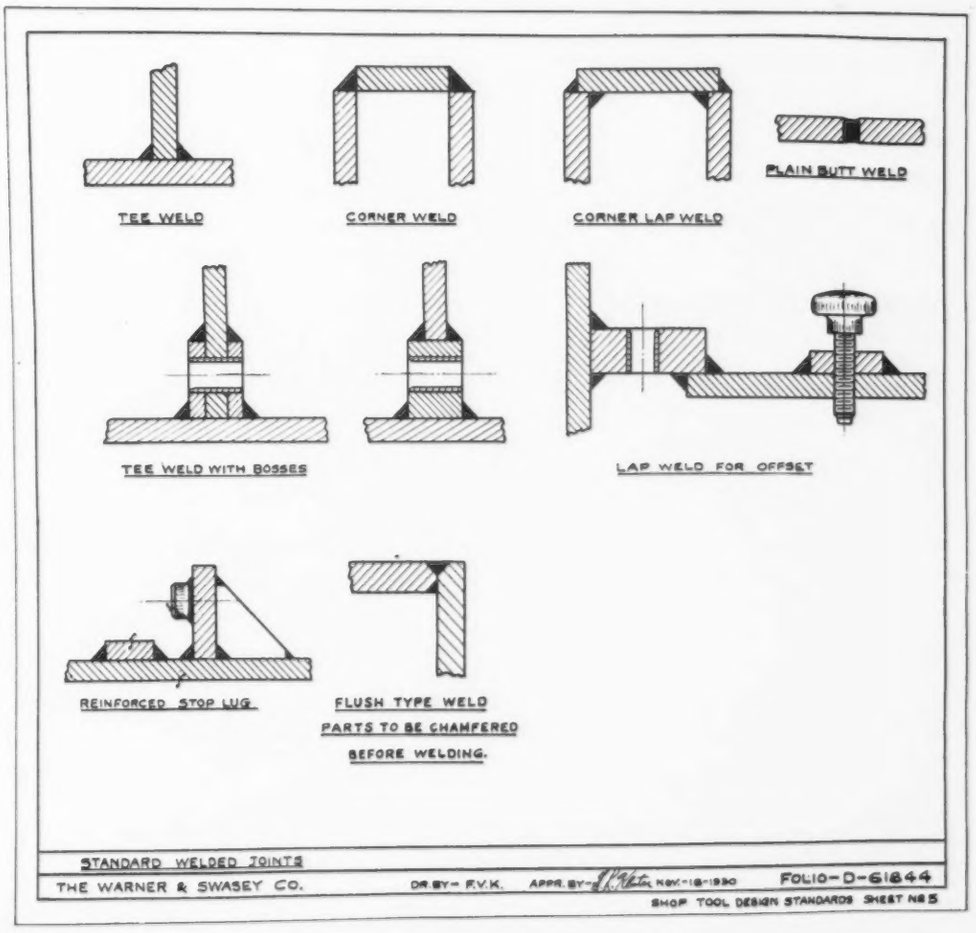
The breakage due to rough handling is eliminated, and the wearing surfaces, where hardened buttons or plates are not required, stand up better.

AT LEFT

THIS data sheet of easily obtainable standard stock materials simplifies the work of the engineer charged with the development of welded jigs and fixtures.

AT RIGHT

THESE welded joint standards simplify the problem of fabrication in welded jigs and fixtures at the Warner & Swasey Co. plant, and, with few exceptions, cover requirements.



The welder must be furnished with a full-size layout of all parts to be burned from the boiler plate. This layout can be made by tracing on transparent sketch paper from the original tool drawing and should be made 1/16 in. oversize on all edges to be burned. This will allow for what is lost by the width of the burning flame, which is about ⅛ in. in plate up to 1½ in. thick plate. The layout should be made 3/16 in. oversize on all edges requiring finishing, leaving ⅛ in. for finish.

In making the burning layout of a plate which has numerous bosses, lugs and ribs to be welded to it, a great deal of the welder's layout time is saved if these are all traced in position on the layout. The welder places this layout on top of the burned plate, using it as a template, pricks punches for all the locations and proceeds to tack weld.

Layout Used as Template

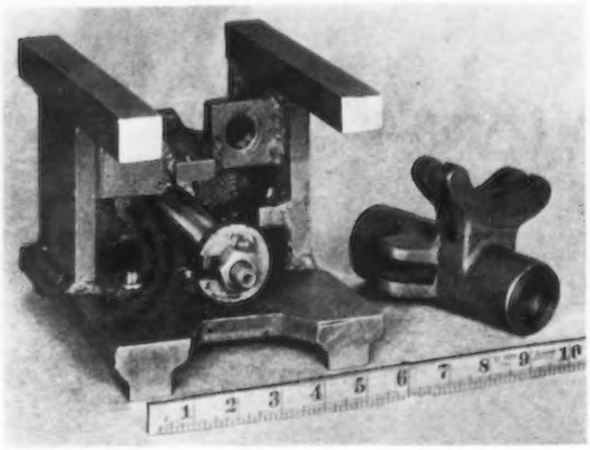
In the case of a rush job, the average jig or fixture drawing can be sent to the welding department in the morning and the afternoon of the same day will find this welded body in the heat-treating department for normalizing. The welded body is then placed in the regular carburizing oven, which is just cooling from the regular day's production work. It is then heated to about 1100 deg. and allowed to cool in the oven overnight, thereby removing all welding strains. It is then sent to the tool room to be machined.

The machining time of the welded body seldom is 5 per cent more than that of cast iron. In most cases it is approximately the same, and in some cases it is less. The reasons are: less stock allowed for finish; shorter bores for bushings and studs; and in the case of plate jigs, a surface grind only is required to clean up.

The points above discussed may best be appreciated by a study of specific cases.

Examples and Tabulations of Comparative Costs

Fig. 3 shows a welded steel drill jig used for drilling seven holes from three directions. The fork to be drilled is shown at the right of the jig.



THE possibility of breakage, when the more brittle metals are used, is well illustrated in this fixture, which has overhanging arms of considerable length.

The significance of welded construction is most appreciated if a mental picture is formed of a cast iron jig for the same purpose. Note in particular the overhang of the legs. This could not be permitted in a cast iron construction. Rough handling of the jig might break the legs, since cast iron is comparatively brittle.

The next points of importance are the bushing and locating lugs. These lugs are made of very light construction, and welded in their proper locations without any of the worries of the cooling strains due to thin and uneven sections, which are present in cast iron construction. To cast the lugs as shown, several cores and much heavier sections would be required. In welded construction, cross-sectional design is of interest to the designer only as it concerns the usage of the jig.

Since sections can be reduced and much of the reinforcing of overhanging parts eliminated, the jig becomes lighter and smaller. Excess weight and size beyond the strength requirement of production consumes non-productive energy too costly to be permitted.

In this case the actual burning and welding time was 4 hr. (An estimated time of 11 hr. was obtained from the pattern department for making a pattern for a cast iron body to answer the same purpose.)

The accompanying table is a comparative statement of cost.

In other words, the welded steel construction cost is approximately 71 per cent of that of cast iron in the above case.

Fig. 4 shows a milling fixture for a 9-in. x 24-in. face of a gear box. Notice should be taken of the lugs which hold the locating and thrust buttons.

These lugs not only take the thrust of the cutter, but also the stresses created by the horizontal clamp screw and the toe clamp. Although the sections are smaller and the ribs are fewer than those required by cast iron, this fixture is very rigid. Bending moments are more readily taken care of in steel construction than in one of

WELDED STEEL CONSTRUCTION

Burning and welding—4 hr. @ $1.75	$7.00
Machining—15 hr. @ $1.75	26.25
Weight—22 lb. @ $0.035	.77
Total	$34.02

CAST IRON CONSTRUCTION

Estimated pattern time—11 hr. @ $1.75	$19.25
Estimated pattern material	.75
Machining time—15 hr. @ $1.75	26.25
Estimated weight—27 lb. @ $0.07	1.89
Total	$48.14
Ratio: Welded steel, 34.02; Cast iron, 48.14	70.6 per cent

IT is possible, comparatively, to reduce the amount of metal required for lug strength and still maintain necessary rigidity in this milling machine fixture which is sufficiently angular in its design to invite trouble if strength is missing.

o o o

cast iron. Note the open design, which eliminates chip pockets and makes cleaning easier.

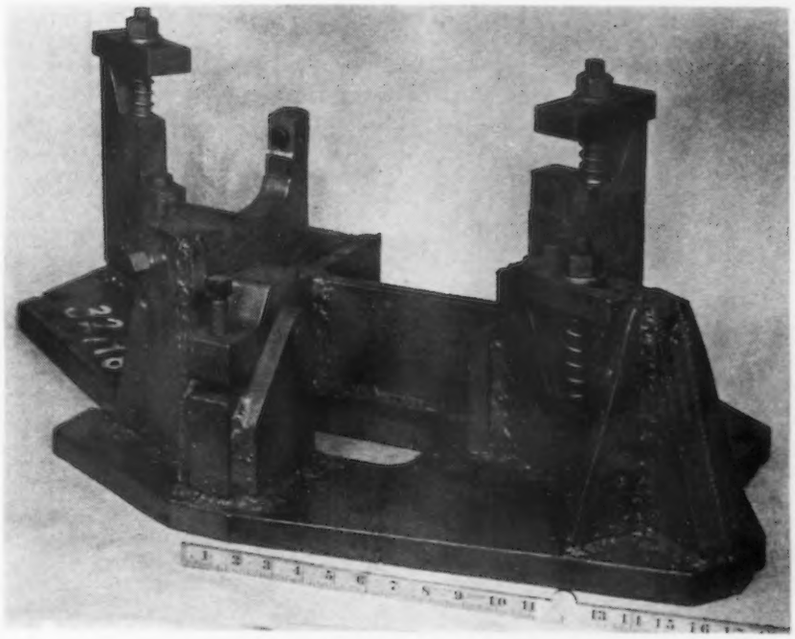
This design would make a very simple pattern if it were to be cast from iron, yet in the comparative statement below is shown a saving of 12 per cent.

Fig. 5 shows a boring and back-facing fixture for a bar-feed head. A picture of the work to be machined is shown at the right of the fixture, the large hole being 5¾-in. diameter, and the boss to be faced 7-in. diameter. In discussing this fixture the same points are important as those mentioned with respect to Figs. 3 and 4. The open construction of this fixture allows the operator conveniently to insert the back-facing cutter, and also observe and measure the cut. It is again apparent that the pattern time will exceed the burning and welding time. Furthermore, if made of cast iron, the weight would increase. The comparative statement below again shows a saving over the old method.

In other words, the welded steel construction cost is approximately 84 per cent of that of cast iron in the above case.

o c o

THE time gained through eliminating the necessity of pattern making in the construction of this boring and back-facing fixture is evident from study of this illustration. The possibility for thinner walls, and therefore less weight, is apparent.



WELDED STEEL CONSTRUCTION

Burning and welding—10 hr. @ $1.75	$17.50
Machining—41 hr. @ $1.75	71.75
Weight—275 lb. @ $0.035	9.63
Total	$98.88

CAST IRON CONSTRUCTION

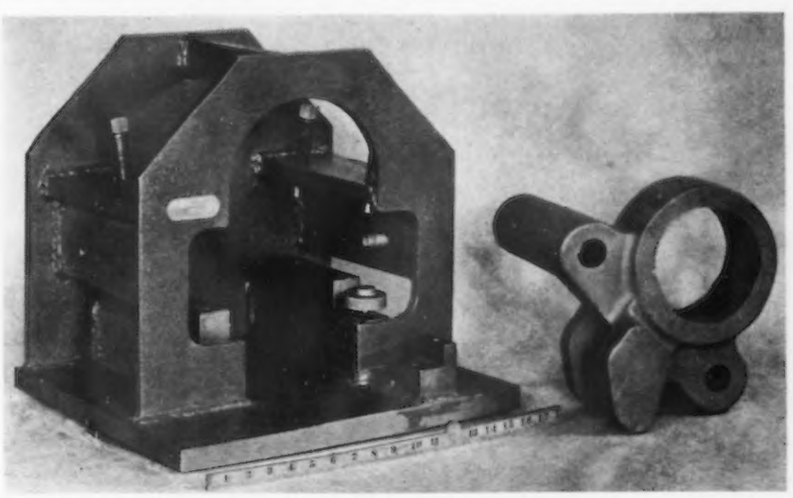
Estimated pattern time—14 hr. @ $1.75	$24.50
Estimated pattern material	2.50
Machining time—37 hr. @ $1.75	64.75
Estimated weight—300 lb. @ $0.07	21.00
Total	$112.75
Ratio: Welded steel, 98.88; Cast iron, 112.75	0.877 per cent

WELDED STEEL CONSTRUCTION

Burning and welding—8.5 hr. @ $1.75	$14.88
Machining—38 hr. @ $1.75	66.50
Weight—155 lb. @ $0.035	5.43
Total	$86.81

CAST IRON CONSTRUCTION

Estimated pattern time—14 hr. @ $1.75	$24.50
Estimated pattern material	3.50
Machining—36 hr. @ $1.75	63.00
Estimated weight—190 lb. @ $0.07	13.30
Total	$104.30
Ratio: Welded steel, 86.81; Cast iron, 104.30	83.2 per cent



Nickel Wrought Iron,

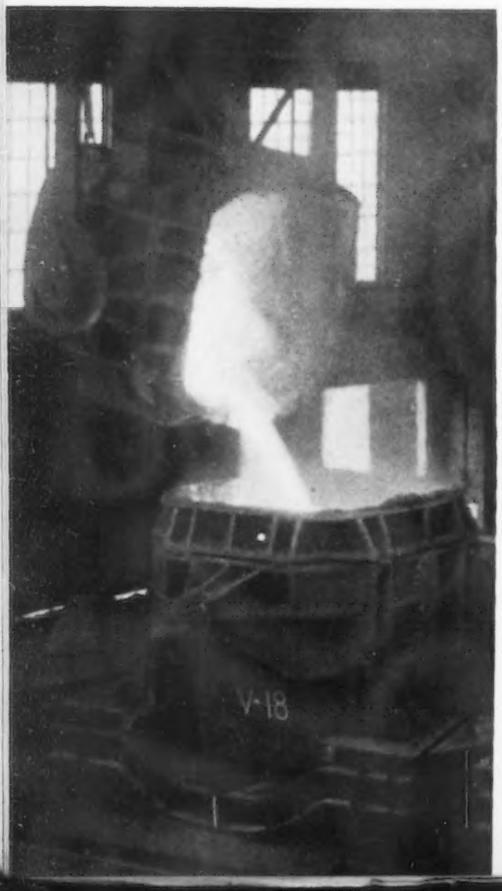
° ° °

BY E. F. CONE

° ° °

FIG. 1—Silicious slag tilted from open hearth into ladle.

FIG. 3—Sponge of wrought iron remains after surplus slag is poured from ladle.



FOR several thousand years, probably as far back as 2000 B.C., genuine wrought iron has found favor with builders and artisans, for during the greater portion of this period it was the only ductile ferrous metal available. However, in late years wrought iron has encountered serious competition from steels and irons which have been greatly improved by the addition of alloying elements. But with the successful alloying of wrought iron in the last few years, all indications point toward a wider use of this material.

Wrought iron containing up to 3.50 per cent nickel is today being made on a commercial scale by the A. M. Byers Co., Pittsburgh. The Aston or Byers process is employed in its manufacture and, although much has been written about this method, the following description is included in order that the review of the new nickel-iron be complete.

The Aston process for the manufacture of genuine wrought iron is noteworthy in that it eliminates laborious and expensive hand labor without a loss of two fundamental and very important characteristics of the iron, i.e., purity of the base metal and the iron silicate or slag content. These two characteristics confer upon wrought iron its desirable properties of resistance to corrosion, high strength and fatigue resistance.

Briefly, the Byers process involves the melting of suitable pig iron in a cupola, after which it is refined in a Bessemer converter. Prior to the refining the iron is subjected to a special desulphurizing process. At the same time a special slag or iron silicate is being prepared from iron oxide and sand in a special open-hearth furnace. At a proper time this slag is tapped from the furnace and carried in ladles to a station directly beneath a so-called processing platform, to which the ladle containing the refined metal or purified iron from the converters has also been conveyed.

The next operation is the key to the entire process—that of refined metal disintegration and slag incorporation. That is, the refined iron is poured at a specified rate into a ladle containing the molten slag. The ladle containing the iron is automatically moved backward and forward to insure a uniform distribution of the refined metal throughout the slag.

Since the temperature of the molten slag is maintained several hundred degrees below the "freezing point" of the metal, the latter is rapidly solidified. This rapid freezing causes the gases dissolved in the metal to be liberated with sufficient force to shatter the metal into small fragments. These fragments settle to the bottom of the slag ladle. The surplus slag is poured off, leaving a sponge-like ball of metal impregnated with slag.

The sponge balls, weighing from 6000 to 8000 lb., are produced at the rate of about one every five minutes. The sponge ball in the slag ladle is conveyed to a 900-ton electrically driven press, where the ball is pressed into a bloom, which is subsequently rolled into the desired product. This

A New Product

DURING the last five years several companies have successfully experimented with alloying additions to wrought iron, usually nickel, copper, or molybdenum. As a result this ancient material has been modernized and, as would be expected, better strength and improved fatigue and corrosion resistances are now available. Nickel wrought iron is being produced commercially by the A. M. Byers Co., Pittsburgh, and this article describes the cycle of operations in its manufacture. As in regular wrought iron, this new metal is processed by the Aston method; with 3 per cent nickel the mechanical properties can be enhanced by heat treatment. The nickel addition improves the hardness and resistance to impact, and raises the yield point and ultimate strength.

series of operations from the melting of the iron to the rolling of the bloom is portrayed in the accompanying photos, Figs. 1 to 5.

To produce nickel alloy wrought iron by this process, nickel is added to the molten iron in the amount necessary to give the desired composition. In this way an even distribution is obtained. A wrought iron containing up to 5 per cent nickel is possible, but for most practical purposes 3 per cent or under is most satisfactory.

A typical chemical analysis of nickel wrought iron is as follows:

	Per Cent
Carbon	0.04 or under
Manganese	0.05 or under
Phosphorus	0.10 to 0.12
Sulphur	0.03 or under
Silicon	0.10 to 0.15
Nickel	2.75 to 3.25
Slag	2.75 to 3.25

The composition of unalloyed or standard wrought iron is approximately the same as that shown except for the nickel content.

The comparative physical specifications for the two classes of wrought iron in the same form of product are as follows:

	Nickel Wrought Iron	Standard Wrought Iron
Yield point, lb. per sq. in	45,000	30,000
Tensile strength, lb. per sq. in.	60,000	48,000
Elongation in 8 in., per cent	22.0	25.0
Reduction of area, per cent	40.0	45.0

It will thus be seen, from these specifications, that the addition of nickel has augmented the yield point 50 per cent and the tensile strength 25 per cent without a marked decrease in the ductility.

A feature of nickel wrought iron is the rather remarkable fact that, as distinguished from standard wrought iron, its properties can be enhanced by heat treatment. Some investigations have been made by the International Nickel Co., to establish, in a preliminary way, the mechanical properties of unalloyed 3 per cent and 5 per cent nickel wrought iron plate, both with and without heat treatment.

These tests were interpreted as follows:

(1) The addition of nickel, up to 5 per cent, to wrought iron apparently increases the proportional limit, yield point, ultimate strength, Brinell hardness, and resistance to impact in both the "as rolled" and heat-treated conditions. Elongation, reduction of area, and resistance to cold bending are reduced.

(2) Water quenching from 1750 deg. F. increases the hardness, yield point, and tensile strength, but is detrimental to the proportional limit. A moderate water quench from 1550 deg. F., followed by a draw at 750 deg. F., retains the properties obtained by the high temperature quench and greatly increases the proportional limit.

(3) Charpy impact tests at room temperature and at minus 40 deg. F. indicate that the addition of nickel eliminates completely the severe brit-

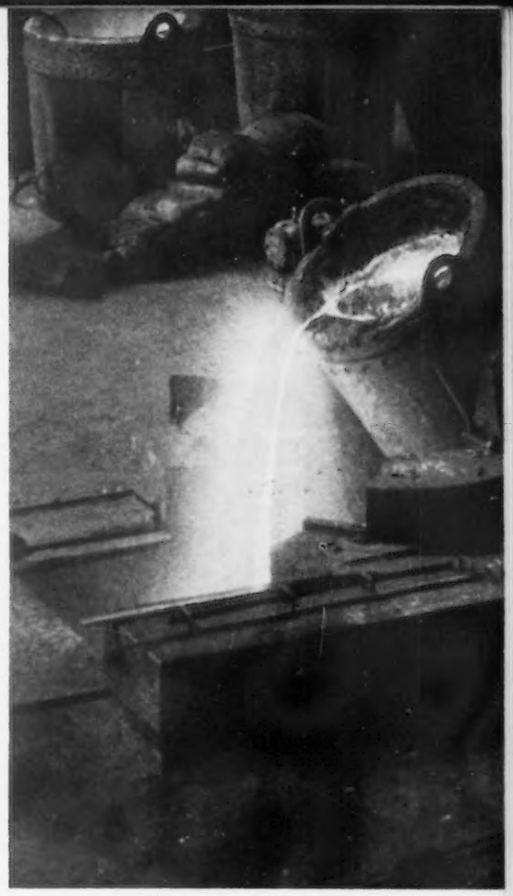
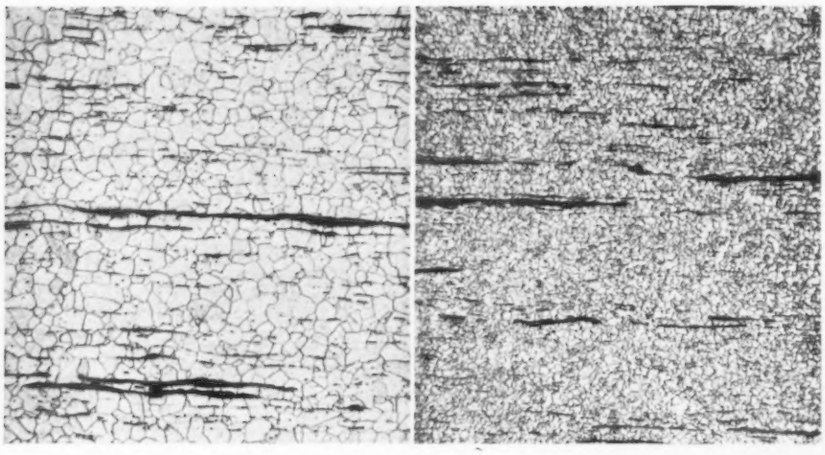


FIG. 2—Processing of refined metal and the silicious slag.

FIG. 4—Dumping the sponge ball onto the platform of an electrically-driven press.



AT LEFT

FIG. 6—Structure of regular wrought iron at the left. At the right is shown nickel (3 per cent) wrought iron. Etched in 5 per cent picral, and viewed at 100 diameters.

tleness at low temperatures exhibited by the unalloyed wrought iron.

(4) Proportional limit determinations on wrought iron plates showed the following results:

Treatment	3 Per Cent Nickel lb. per sq. in.	5 Per Cent Nickel lb. per sq. in.
As rolled	30,800	37,600
Water quench from 1750 deg. F.	27,200	31,000
Water quench from 1550 deg. F., drawn at 750 deg. F.	46,200	53,500

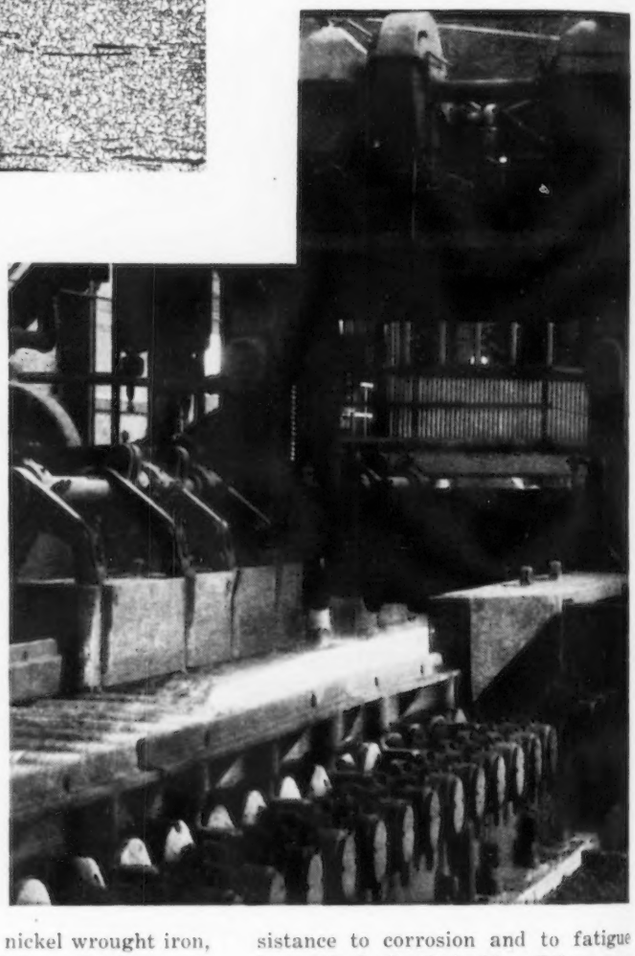
Thermal critical points of the nickel wrought iron are reported as follows:

	A_c	A_r
3 per cent Nickel	1494	1310
5 per cent Nickel	1420	1220

Some data are available on the relative fatigue properties of low-manganese (medium manganese) steel, wrought iron and nickel wrought iron (3.42 per cent Ni). This information was published in a paper by B. B. Wescott and C. N. Bowers, Gulf Research & Development Corpn., Pittsburgh, entitled "Corrosion Fatigue and Sucker Rod Failures," presented at the annual meeting of the American Petroleum Institute in Chicago, Oct. 24, 1933. These data are reproduced in Table I.

The significant points in this table are the superiority of the manganese steel in non-corrosive fatigue, the high ratio of fatigue limit to tensile strength of the two wrought irons, and the relatively severe damage to the steel from corrosion fatigue. It was also reported that there is no constant relationship between corrosion fatigue limit and tensile strength. Despite the data in the table, the authors mentioned that a great improvement has been obtained from the replacement of steel by wrought iron for sucker rods in the oil industry. It is also stated by others that nickel wrought iron has already been demonstrated to be unusually successful in that capacity, as demonstrated by recent experiments.

There are many possible uses for this new product, nickel wrought iron, as can be deduced from the data presented. The principal application thus far, as already referred to, is in sucker rods, where its excellent resistance to corrosion and to fatigue is particularly desirable. Other possible uses include chain, staybolts, engine bolts, railroad draw bars, boiler and ship plate.



AT RIGHT

FIG. 5—The pressed bloom is reduced to billet in a 40-in. mill.

TABLE I

Fatigue Properties of Low-Manganese Steel, Wrought Iron, and Nickel Wrought Iron

Conditions of Test	Fatigue Limit			Ratio of Fatigue Limit to Tensile Strength		
	1.25 Per Cent Mn Steel	Wrought Iron	Ni-Wrought Iron	1.25 Per Cent Mn Steel	Wrought Iron	Ni-Wrought Iron
Non-corrosive (ordinary fatigue limit)	48,900	30,400	40,100	0.49	0.64	0.64
In oil-well water saturated with natural gas and free from air	19,600	19,600	25,600	0.20	0.41	0.41
In oil-well water saturated with natural gas and hydrogen sulphide and free from air	14,600	16,400	14,900	0.15	0.34	0.24

Late Returns from Laboratories and Mills

BY T. W. LIPPERT

The Iron Age, New York

o o o

A DIRECT transference of liquid steel to rolled product is a Gargantuan step. Once achieved, it would eliminate many time-consuming and costly operations. Of the many attempts in this direction, the recent experiments of Hans Bleckmann seemingly are the most auspicious.

As reported in *Stahl und Eisen*, an experimental machine, as shown in Fig. 1, was set up prior to the construction of a regular experimental apparatus. Actual runs showed that it was possible to extract heat from an overheated liquid steel in sufficient quantity and with sufficient rapidity to produce a correct degree of solidification between the rolls. Also, if the steel must be teemed uninterruptedly, there is a definite limit on the thickness of section that can be rolled. If too thick a section is rolled, the interior will remain liquid without receiving deformation, and the plate will retain the structure of cast steel.

The chief advantage of direct rolling from liquid steel is that it permits the production of plates from highly superheated steel. These plates subsequently can cool to correct rolling temperature, after which they can immediately be worked up in an ordinary rolling mill. The small experimental machine, Fig. 1, consists of two half-cylinders of sheet-copper, each with a radius of 13 in. and a width of 4.7 in. These are cooled by water sprays inside. Disks or flanges of refractory material with a 20.4-in. radius are attached, one at one end of each copper half-cylinder. Each flange forms a dam for the wedge-shaped trough of liquid metal between the half-cylinders. One half-cylinder rotates on a fixed bearing — the other works on an adjustable bearing by which the roll gap can be varied. The molten metal is fed in a constant stream through a fire clay tunnel into the trough between the rolls, which are rotated by a hand crank. The rolled product drops through to the floor between each reciprocation of the copper half-cylinders. Very exact adjustment of the speed of flow, width of gap, and speed of rolling is necessary. A constant head of liquid steel also is very desirable. If the speed of flow slackens and then quickens, cold shuts are likely to form on the surface of the plates and they cannot be removed by subsequent rolling.

Polished and etched specimens of plates from this machine show satisfactory dendritic structure.

A larger machine is now being built. It will have internally-cooled rolls 79 in. in diameter, and will roll plates 0.8 in. thick. These rolls are hollow cast iron cylin-

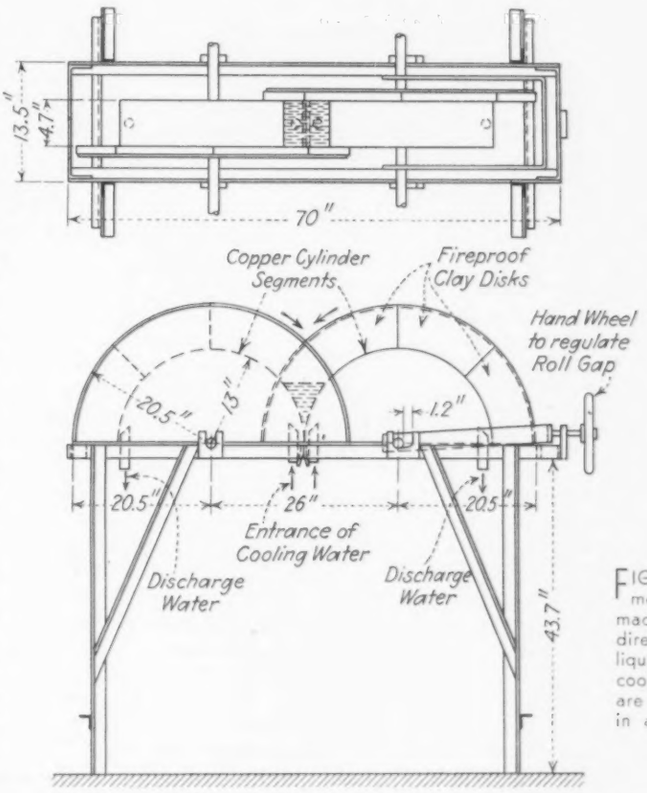


FIG. 1—This experimental German machine rolls steel directly from the liquid state. After cooling, the plates are further reduced in an ordinary rolling mill.

ders, fitted with copper bands 0.4 in. thick. The pressure on the copper-surfaced rolls will not be very great, as the steel will be in a highly plastic condition when passing through them. The wedge-shaped space above the roll gap will be filled with superheated steel to a depth of 34 in. above the horizontal axes of the rolls. A single charge of steel 34 in. deep will pass through the rolls in 3.3 sec., assuming the working to be continuous. Thus, with a plate 20 in. wide, 60 lb. of steel per second can be rolled. That is, about 12 tons of steel can be dealt with in 7½ min., the plate thickness being assumed to be around 0.8 in.

Finishing Steel Jet Black in Five Minutes

A LUSTROUS jet black finish on steel products is often desirable to promote sales. The Alrose Chemical Co., 80 Clifford Street, Providence, R. I., is now marketing Jetal salts, the aqueous solution of which will produce a deep black, scratchproof surface in about 5 min.

No baking, spraying, plating or other complicated procedure is required. The bath is prepared by dissolving the salts in water at room temperature. A welded steel container is used for the liquid, which is heated by steam, gas or oil to a temperature of 130 deg. C., or 270 deg. F. The parts to be blackened can be handled on racks, in bulk, in baskets or barrels, depending on their nature. A cleansing prior to immersion is necessary. All oil or rust spots must be removed and pickling solutions must be completely washed away. The manufacturers state that the finish will not chip, scale, peel or discolor. Blackened strips can be given several passes through reducing rolls, and can be stamped or shaped without impairing the black surface. Samples of polished steel can be blackened to produce black mirrors of high luster.

Solid Steel Roads

HIGHWAYS constructed of cast iron blocks or of steel grids filled with concrete are no longer novelties. However, the use of asphalt coated steel plates is not so common; an experimental road section of this nature now is being used in Transvaal Province, South Africa. No foundation was used.

ABOVE

FIG. 2—A portable steel road developed in England for military purposes.

AT RIGHT

FIG. 3—X-rays are used here to determine the fit of various types of rivets.

The existing road was leveled and covered with grit, and then upon this steel plate sections about ¼ in. thick were placed with the edges of the sections welded together. To prevent excessive wear, the surface of the steel was coated with asphalt. Steel plants in that section insist that such a road is practically everlasting and that the cost is considerably less than ordinary concrete construction. Roads of this general type are currently being used to a limited extent in France and Germany.

Another form of steel road construction has been patented by Major H. S. Briggs, of England. This method makes use of a series of pressed steel channels laid transversely to the length of the road; the flanges of the channels interlock with each other to make a single unit. This mode of construction has been developed primarily for military purposes, in order that highways can be quickly laid down over soft or marshy ground. The channels are made of steel of uniform thickness, from ⅛ to 3/16 in. thick, depending on the strength desired. For curves special wedge-shaped sections are used. Advantages claimed are speed and ease of placement by unskilled labor, the small space occupied during transportation, and the moderate amount of work required on a foundation. Several of these channels fitted together are shown in Fig. 2. In addition to roads, these sections may be used for floorings, truck parking platforms, etc.

Riveting Defects X-Rayed

IN any type of rivet the main theoretical principle is that the shaft shall expand and fill up the hole as completely as possible, and the head and shaft shall be alined. A riveted structure should approximate the strength of the solid material, and ill-fitting rivets are particularly to be avoided in structures subject to vibratory stress.

In examining rivet fits radiographically the interpretation of pictures is complicated by curious shadows cast due to the relatively complex shapes of certain types of rivets. However, V. E. Pullin, Woolwich, England, has secured excellent results with pictures parallel and at definite angles to the axis. Three parallel views are shown in Fig. 3. The top view is that of a hydraulically driven rivet. The concentric rings show that the holes are not in alinement

and the rivet shank fits imperfectly. The middle view is that of an almost perfectly fitting hand-hammered rivet. The lower radiograph is that of a pneumatically hammered rivet wherein the rivet has become distorted, the holes are not alined perfectly, and the fit is poor in one section.

Investigations of this type on experimental rivets greatly facilitate the selection of suitable sizes and shapes of rivets in order to improve the strength and life of built-up structures.

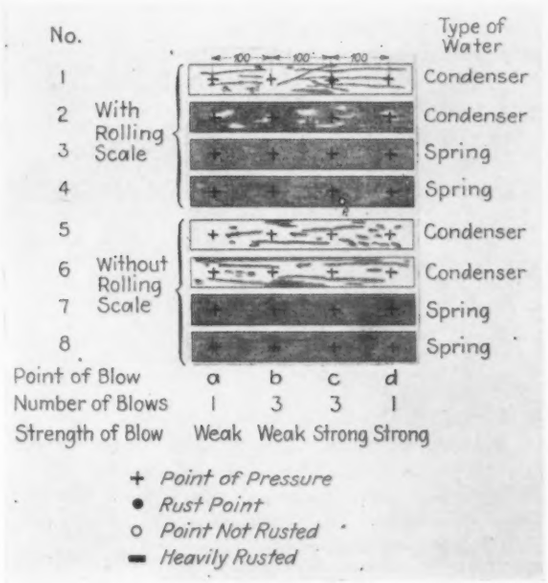


FIG. 4—Iron tubes were hammered at various outside points to determine the effect on interior rusting. This drawing shows one set of results.

Does Pressure Influence Rusting?

MANY practical observations have given rise to the conjecture that pressure accelerates the rusting of iron and steel. The lack of experimental evidence along this line prompted A. Baader to conduct a series of tests which recently were reported in *Korrosion u. Metallschutz.* Although the results are somewhat negative, it is of interest to examine the mode of testing and the type of data secured.

Dents of varying intensity were made on the outside of water tubes by means of a punch or chisel, and the influence of such "pressure spots" on the rusting of the inner surfaces was determined. All the factors likely to affect the results were varied. The arrangement of the dents, the force of the blows, the condition of the inner surface of the tube (coated with bitumen, rolling scale attached, sand-blasted, heat-treated), type of water, etc., all were changed. One set of results is shown here in Fig. 4. Eight half sections of tubes are shown, with the type of water used and the condition of the inner surface of the tubes. Tubes 1 to 4 had rolling scale attached, but tubes 5 to 8 were sanded before denting. Points *a* and *d* were hit once, and points *b* and *c* hit three times; *a* and *b* were struck lightly, and *c* and *d* strongly. Thus four different impressions resulted. Tubes 2 and 3 came from old boilers, but all the others were new. Tube 6 is a control tube for 5, and 8 is a control tube for 7.

After contact with water for 12 days, the 32 points were examined and not one showed definite results. Point *c* in tube 1, Fig. 5, shows a little widening of rust ribbon, whereas point *c* in tube 4 remained rust-free, although the surrounding area rusted.

The entire test showed that in only 21 cases out of 98 could differences in behavior be observed between the pounded points and the surrounding metal. Of these 15 were due to damage of the protective coating, and one to the embedding of foreign metal. Further points of note were that the distribution of the rust marked out macroscopically invisible damage to the protective coating, that condenser water was more suitable than spring water for corrosion tests, and that rust deposits were in two layers, one black and the other brown.

Reliable Temperature Measurement

ALTHOUGH pyrometers of high accuracy are available for some manufacturing operations, wholly satisfactory measurements of liquid steel temperatures are yet to be obtained. In commenting on this search for a reliable method, R. S. Whipple, of England, has stated that disappearing filament pyrometers, although often showing errors, appear to be the best for determining temperatures of liquid steel in the furnace. Total radiation pyrometers, however, are not so desirable as they are subject to many influences leading to errors in results. Direct determinations by thermocouples are often used but many errors creep in due to time lag and rapid deterioration of couples and protecting tubes. Mr. Whipple believes that American developments along the line of Dr. Fitter's silicon-carbide and carbon couples may ultimately become the most reliable instrument. Couples using a central wire of tungsten contained within a carbon sheath are believed to be hard to calibrate and variations creep in due to non-uniformity of the carbon.

Many other instruments have been devised in attempts to reliably measure high temperatures. Among these are procedures employing physical properties of the bath such as density, thermal expansion, surface tension, heat capacity or specific heat, vapor pressure, thermal conductivity, electrical resistance, velocity of sound, magnetic properties, and ionic emission. A few of these systems have possibilities, but most of them are subject to discouraging errors. One major requisite to secure better operation of any of the better devices is the production of a better refractory to house instrument part subject to furnace heat. Such a development would immediately reflect in an improvement in the life and dependability of existing instruments.

The Engineering Aspect of High-Strength Sheet Steels

By V. H. LAWRENCE

Metallurgical Engineer, Alan Wood Steel Co.

° ° °

THE phenomenal interest in high-strength sheets created during 1934, first by the wide publicity given the railway equipment featuring light-weight design and high-strength materials, of which the Burlington Zephyr is the best known, and then fostered by the development and sale of commercial high-strength steels by three or more producers, has led the writer during the last few months to visit a number of engineers, fabricators and manufacturers to ascertain as accurately as possible the future of high-strength sheet steels, the manufacturing limitations of these steels, and primarily the engineers' viewpoint as to the value of high-strength sheets.

The following is largely a resumé of the points discussed, arranged in sequence as related to definite engineering factors, and represents the pertinent points that the engineers, fabricators and manufacturers either by experience, hearsay and/or lack of sales resistance have determined, anticipate or fear through the growing use of high-strength steels.

Because any comments which are not wholly favorable or enthusiastic might be construed as unfair criticism of a new product whose manufacture has so far been limited to a relatively few producers of steel, the writer wishes to go on record as being associated with a producer which has been for some years, and is now, producing high-strength sheet steels, and his personal opinion is that there is a large engineering field for such a product.

As a question of economics, the use of strong light-weight materials is desirable, both from the standpoint of conservation of raw materials suitable for the production of ferrous materials, and, in the case of rolling stock, the further conservation of fuel justifies taking full advantage of the maximum safe strength possibilities.

On the other hand, ill-considered applications leading to whole or partial failure will discourage not only those immediately connected with the failure, but a similar group who through hearsay may know of the failure without appreciating the reason therefor.

Among the bright spots favoring the more extended applications of high-strength sheets is the fact that in many existing applications sheet steel is unnecessarily heavy, and could be reduced in thickness and weight successfully with standard materials.

The attention focused on weight reduction will undoubtedly result in high-strength sheet steels being used on such applications and being credited with the advantages accrued.

The anticipated setback from the growth in popularity of high-strength steels will be the tendency to base applications on unit stress alone, without regard or with insufficient regard to the other features involved.

Fiber Stress and Engineering Features Not Calculable by Formulas Must Be Considered

To bring these points to the prospective redesigners' attention, the writer is listing those features involved:

1.—Establishing of a safe unit fiber stress, which is affected by:

(a) Tension properties, particularly the location of the elastic limit

or yield point or proportional limit.

(b) Corrosion resistance and its effect on the unit area (and inversely on fiber stress) after service.

(c) Rigidity; and it is to be noted that no type of steel or method of treatment affects the stiffness, i.e., the Young's modulus of elasticity remains 29,000,000 to 30,000,000 lb. per sq. in. regardless.

(d) Fabricating effect on static and dynamic properties; i.e., the favorable or detrimental effect of cold bending, punching or welding on the tension or impact properties of the steel.

(e) Fatigue properties and relation of live to dead loads.

2.—Determining those engineering features not calculable by formulas, including:

(a) Desirable factors of safety in relation to importance of the member.

(b) The protection offered over service life by painting, coating and inspection.

(c) The necessity of rigidity in excess of that required for strength or deflection as a psychological factor in service.

(d) The relation of thickness and rigidity to objectional phonetics; i.e., the increased tendency towards echoes, drumming, etc., due to light wall thickness insufficiently supported.

Relation of Safe Working Load to Static Tension

Considering these items in detail and their inter-relation, the relation of safe working load to static tension properties should be considered.

On commercial structural steel, hot-rolled, such as is covered by A. S. T. M. Specifications A7 or A9; Federal Specifications QQS-711 or QQS-721, A. A. S. M. Class "A", etc., the following relations exist between static physical properties:

Yield point (elastic limit)=½ tensile strength.

Elongation in 8 in. (ductility)=1,500,000÷tensile strength.

Safe working load=¼ tensile strength or ½ yield strength.

Using A. S. T. M. A7-33 as an example:

Tensile strength specified—55,000 to 65,000 lb. per sq. in.

Yield point specified—½ T. S. but 30,000 lb. per sq. in. minimum.

Elongation specified—1,500,000÷T. S. or 23 per cent minimum.

Safe working load (American Institute Steel Construction)—16,000 lb. per sq. in.

For years, basing experience on steels of the same general characteristics, the safe working load was assumed as approximately one-quarter the maximum ultimate strength until it was pointed out that the safe working load had no real relation to the ultimate strength, but should be considered more accurately as one-half the yield strength, which, on these steels, give the same values. The reasoning is so obviously correct and is based on the knowledge that any load exceeding the yield strength and thereby introducing permanent set constitutes failure of the part and throws part of the load on adjacent parts. The full realization of strength value of high-strength steels, on which the structural relationship varies from standard steels, demands the acceptance of this method of arriving at safe working loads by a method of metallurgical accuracy.

As a comparison, the tension properties of the three better known high-strength steels are:

	A	B	C
Yield point	50,000 to 60,000	70,000 Minimum	70,000 to 85,000
Tensile strength	65,000 to 75,000	90,000 Minimum	90,000 to 105,000
Elongation in 2 in.	27 to 22 per cent	20 per Cent Min.	20 to 26 per cent
Elongation in 8 in.	.....	.....	1,500,000 T.S.

Using the extremely high-strength steels "B" and "C" as examples, if the safe working load is assumed as one-quarter the maximum ultimate strength or approximately 26,000 lb. per square inch, an increased strength of only about 60 per cent or a decreased area of 37 per cent can be considered.

If, however, a safe working load of one-half the yield strength is assumed, or 35,000 lb. per square inch, a designing advantage of 235 per cent over structural steel is permitted. This use of a 35,000 lb. fiber stress still permits as a factor of safety 35,000 lb. per square inch before permanent set, as compared with 14,000 lb. per square inch in the case of A. S. T. M. A7, where a fiber stress of 16,000 lb. is used in conjunction with a yield strength of 30,000 lb. per square inch.

As an example, using a section ⅛ in. x 1 in. instead of a ¼ in. x 1 in. structural steel, the safe working load would be:

	Steels "B" & "C" ⅛ In. × 1 In.	A.S.T.M. A7 ¼ In. × 1 In.
Safe working load.	4375 lb.	4000 lb.
Failure due to permanent set, would occur at.....	8750 lb.	7500 lb.

The Effect of Corrosion

If, however, corrosion rates were the same in both of the above steels, and corrosion with resultant reduction in cross-sectional area becomes a factor of strength, then the point at which the cross-sectional area had been reduced to the extent where the full yield strength existed in the structure would be arrived at sooner in the light-section high-strength steels.

When increased tension properties permit a decrease in thickness of 40 per cent, i.e., from ¼ in. to 10 gage or from 3/16 in. to 12 gage, an increase in resistance to corrosion and/or abrasion of at least 66 2/3 per cent is desirable to insure the same life in service.

Corrosion resistance can be predicted with fair accuracy. It is obviously uneconomical to hold up a new steel for 5 to 10 years to permit predictions on the basis of service tests, so producers of high-strength corrosion-resisting sheets are basing predictions of corrosion resistance on accelerated corrosion tests, the results of which compare favorably with service life.

Corrosion resistance under a multiplicity of varying conditions is at best hardly a term which can be converted into engineering terms, and is probably the largest factor in the use of high-strength steels on which the purchaser must design and buy on faith in the producer.

Due to the inability of any superficial chemical, thermal or mechanical treatment to change the modulus of elasticity, intelligent redesign must take into account the necessity of maintaining the same moment of inertia in the redesigned section through the use of ribs, beads, corrugations, etc.

Fabricating the New Steels

Intimately connected with the redesign for rigidity is the ability of the steel under consideration to be fabricated to the new design on existing or available equipment without serious disturbance of the physical properties by such fabrication.

Some steels cold work harden readily, and the work-hardened area may increase in strength with a greater increase in brittleness to

the point of susceptibility to service failure due to shock or fatigue, where it is to be noted that stress concentrations due to design often fall at areas which are subject to work hardening. Other steels are radically affected by hot working, particularly those whose properties are obtained by previous treatment.

Welding as a means of fabrication is so common that its effect on the finished structure must be considered, not only where it is contemplated as a part of the original fabrication procedure, but with the possibility that it might be used as correction in case of fabricating failures or in service repairs later.

Successful fusion welding of sheet steel usually involves greater restrictions on the parent metal than are required for acceptable welds on structural members or heavier flat rolled sections.

This is due, in part, to the fact that sheet steels are readily adaptable to automatic welding where no allowances can be made for metal defects, to the necessity on light material of producing not only a sound, strong weld but a smooth appearing weld as well, and to the air hardening possibilities of thin sections where the air quenching effect is more pronounced and no self-annealing is encountered.

For fusion welding heavy sections, plates, etc., the following maximum limits in chemical composition are generally adopted:

Carbon	not over 0.31 per cent
Manganese	not over 0.75 per cent
Silicon	not over 0.25 per cent
Sulphur	not over 0.05 per cent

The relation of welding to corrosion resistance must also be considered. Is a welding rod (if used) available which will result in welds of equal corrosion resistance in the deposited metal, or can a bead of sufficient area and density be produced to permit the use of ordinary rod? Is there a possibility of electrolysis between parent metal and deposited metal due to differences in potential developed by different chemical compositions? Laboratory tests or accelerated corrosion tests again must be relied upon for answers to these possibilities.

How High Unit Strength Is Obtained

The most important feature in welded construction, the effect of the weld on adjacent parent metal, requires some consideration of the methods of production of high-strength steels, and the writer will digress for a moment to consider the means by which high unit strength is obtained.

High unit strength in any of the ferrous material is a function of one or more of the following factors:—

(a) Chemistry.
(b) Heat treatment.
(c) Mechanical treatment.

The advantages and disadvantages of each method of producing high-strength steel are summarized in order.

(a)—*Chemical Composition*

The strength (static tension) may be increased above that of pure iron (40,000 lb. per square inch) by the addition of hardening elements—carbon, manganese, silicon, chromium, nickel, molybdenum and vanadium being the most common. Carbon will increase the ultimate strength to the extent of about 1000 lb. per point (0.01 per cent) and the elastic limit (yield point) about 600 lb. per point; manganese at the rate of 100 lb. per point in ultimate strength and 60 lb. in elastic, with the other elements in decreasing value.

The simplest method of producing high-strength sheet is to combine the above hardening elements to produce the desired ultimate strength, and hot-roll and normalize or anneal. To produce material of extremely high elastic limit (at least twice the safe working load) requires, therefore, an extremely high ultimate strength with correspondingly low ductility. The major objection to this type of steel is brittleness adjacent to a weld, because in view of the high concentration of hardening the elements air quench to extreme brittleness from welding temperatures.

(b)—*Heat Treatment*

The same values in ultimate strength, higher values in elastic strength and therefore higher safe working loads can be obtained by quenching and tempering steels much lower in alloy or carbon concentration. Better ductility and higher fatigue values are exhibited by the quench and draw treatment. The objections are extremely high cost and the inability to obtain a reasonably flat-finished sheet.

(c)—*Mechanical Treatment*

The high ratio of elastic limit to ultimate strength shown by existing high-strength steels indicates the existence of internal stress, probably set up by some degree of cold work or sub-critical rolling followed by partial stress relieving. Where the relation of cold work to base metal chemistry can be controlled, that the annealing effect of weld temperatures balances the air-quenching effect inherent in the chemical composition, a high degree of weld strength is to be anticipated.

Metal Insecurity as a Factor

Of the engineering features not calculated by formula, two points warrant repetition for emphasis.

The psychological requirement of rigidity often in excess of that required for strength is important. The mental insecurity of the individual who is in contact with a structure of considerable resiliency, even though excessively strong, may lead to a considerable reluctance toward further utilization of such a structure.

Noise, drumming and echoing due to decrease of metal thickness over large unsupported areas may be anticipated in some instances, and is generally objectionable. The use of silencers in conjunction with reduced thickness steel may often overbalance the increased saving in weight or cost anticipated.

Questions That Must Be Answered

The ultimate decision as to the use of light, high-strength steels and the selection of the particular type of steel for the purpose can be more intelligently done by considering which points are important and then verifying them either personally or by reliance on responsible authorities. Summarizing these features and where and how they may be verified:—

1.—By the Engineer:

(a) Can the design be modified to permit substantial saving in weight or cost or additional factors of safety?

(b) Will reduction in metal thickness conflict with any existing insurance or inspection standards, and, if so, are the advantages to be accrued sufficient to justify an attempt to have these limits modified.

(c) Can the information in paragraphs 2, 3 and 4 be obtained and relied upon?

2.—By the Buyer's Laboratory:

(a) Are the physical properties uniform and within reasonable relation to those anticipated or guaranteed?

(CONCLUDED ON PAGE 54)

Magnetic Separator Provides High Agitation

MAGNETIC separating equipment that utilizes alternating current for energizing is announced by the Magnetic Mfg. Co., Milwaukee. A new type "A.M." machine, pictured on page 32, is said to be particularly adapted for finely ground materials having a high magnetic content of considerable quantity to be eliminated or recovered.

The equipment has two belt conveyors, one a feeder mounted below and at one end of the other. Within the upper conveyor is mounted an electro magnet, energized by any standard a.c. voltage. As the feeder delivers the mixed material to a point of discharge, the iron and magnetic particles are lifted to the upper conveyor and held in suspension and at the same time are subjected to agitation and pulsation for the dropping of any clinging non-magnetic material. The magnetic particles on this conveyor are carried to the conveyor end and there, no longer being under magnetic influence, are discharged. The non-magnetic material, in the meantime, has been discharged into its receiving area. This automatic handling of both the magnetic and non-magnetic material completes the segregation.

Totally-Inclosed Horizontal Duplex Power Pump

WORTHINGTON PUMP & MACHINERY CORPN., Harrison, N. J., is marketing a new 18-in. stroke, totally-inclosed, horizontal duplex power pump for a wide range of services. It is illustrated on page 32. The power end is self-contained, is supported on the foundation throughout its length, and is designed to minimize foundation cost. The power end frames are cast en bloc, and all moving parts are entirely inclosed and are oil tight. The crankshaft, pinion shaft and crankpin bearings are the self-contained, double row, tapered roller type. An oil pump, driven by a crank from the pinion shaft, supplies oil for the flood lubrication of all bearings and the pressure spray lubrication at the intermesh of the gear and pinion. The main gear and pinion are full herringbone and may be of any ratio required up to 9.66 to 1.

Although developed primarily for refinery service, the pump is also suitable for field and pipe line use for loads up to 200 hp. The design is for use with either the packed piston or outside-end-packed plunger types of liquid ends for either hot or cold liquids.

Small Parts Cleaning in Continuous Movement

A NEW washer for metal parts that subjects the work to a soaking and a spray wash and transfers it from one drum to another in continuous movement—an important feature when handling threaded work and other delicate parts—is announced by N. Ransohoff, Inc., Cincinnati, Ohio, and is pictured on page 32.

In the first drum the work is eased along by a welded worm, submerged in hot cleaning compound that facilitates drying later. The dirt is completely loosened. The work passes continously through a patented head into the next compartment, perforated, where a hot spray removes loosened dirt and chips. The last section is a draining drum from which the work emerges to dry of its own heat. Fresh compound is pumped from a tank below. A skimming dam in the tank removes the scum. A chip pan and removable screen chip basket effectively removes the chips.

The unit is completely self-contained. Driving motor and pump are hung on the side. Tight hood, to be connected to exhaust system, prevents escape of vapor to the room. Drum rolls on chilled rollers which turn free on roller bearing stub shafts. Drum and worm construction prevents work from sticking, insures all work coming out.

Hydraulic Dynamometer Employs Water Absorption

HYDRAULIC absorption type dynamometers for the measurement of torque and horsepower and consisting of an especially constructed stator, within which one or more special rotors run, is announced by the Torque Products Co., 875 East Lake Forest Avenue, Milwaukee. The equipment is illustrated on page 32.

This dynamometer can be operated from either end of shaft and in either direction of rotation, and is said to be particularly suited for the testing of all types of engines, motors, turbines, transmissions, speed reducers, axles, brakes, etc. The equipment is also available for study of the characteristics of automobile elements and for laboratory use. The medium of absorption is water.

Bench Sander-Grinder Has Metal Belt-Bed

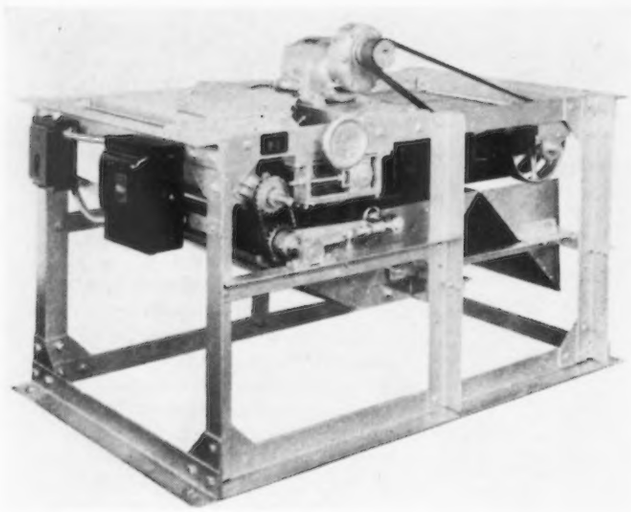
THE 6-in. bench type sander and grinder pictured on page 32 is adapted for removing burrs, smoothing off rough stampings, knocking down weld spots and work of this type, frequently routed for grinding wheel work. This type B12 unit is built by the Porter-Cable Machine Co., Syracuse, N. Y., and may be equipped with an emery belt and include polishing operations. Either belt or motor drive may be used. The flat metal grinding bed is 6 in. by 10 in. Machine height 9½ in.; width 11½ in.; bed length, no motor, 25 in., and with motor 34 in.; weight, no motor, 125 lb.; motor ½ hp. or ¾ hp.

New Gage Records Absolute Pressure

A PRESSURE recording instrument, so compensated as to read direct in absolute pressure without the need of applying various complicated corrections, has been announced by the Bristol Co., Waterbury, Conn. The device is shown on page 33.

Two measuring elements are coordinated through a special differential linkage; one element connected to the vacuum line, and the other functioning in connection with the compensating features of the recorder.

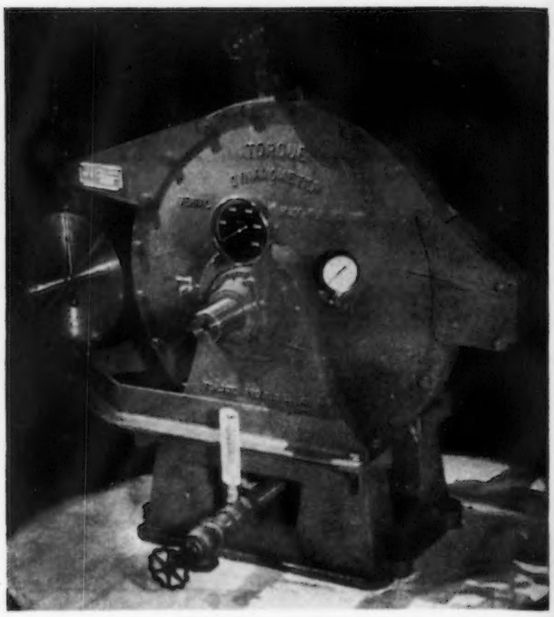
The practicability of the instrument for use by miscellaneous operators and practical men is featured as of value in the many processes in which high vacuum is an important factor.



ABOVE

Magnetic Separator Provides High Agitation—Magnetic iron ore, sponge iron and copper powder are among the materials which can be handled on this machine. Two conveyor belts are employed.

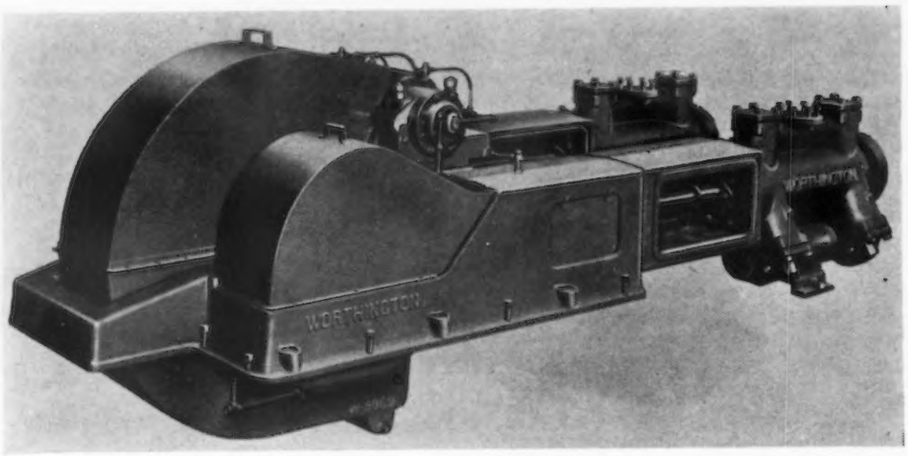
See page 31, column 1.



ABOVE

Hydraulic Dynamometer Equipment in Wide Range—Operating simplicity is emphasized by the maker of this absorption-type unit which employs water as the absorption medium.

See page 31, column 2.



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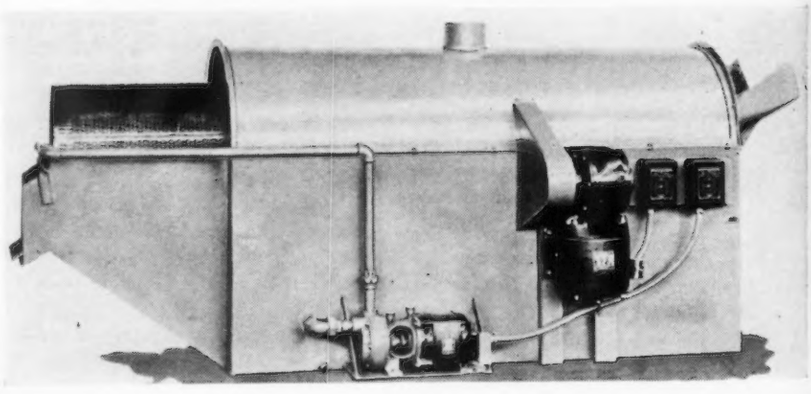
Totally Inclosed Horizontal Duplex Power Pump—The power end is self-contained and bed-supported for its entire length. The design is said to reduce foundation cost.

See page 31, column 1.



AT LEFT

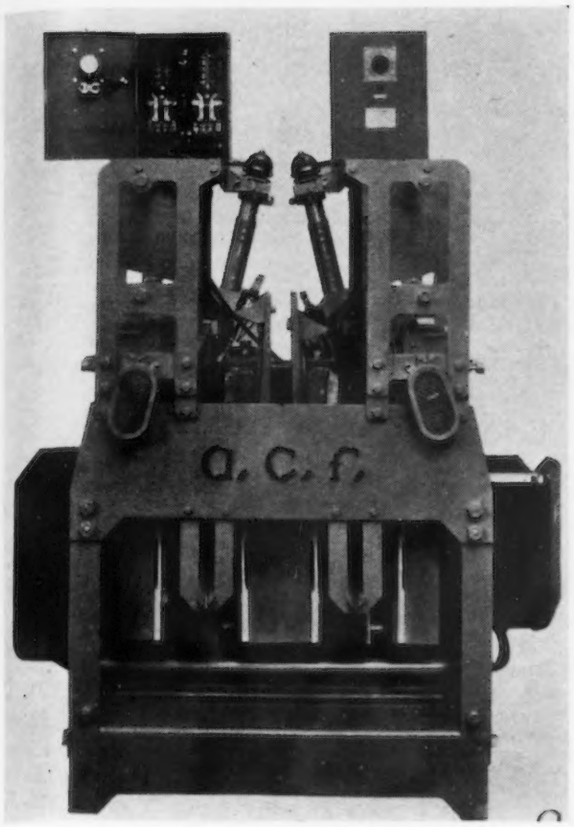
Bench Sander-Grinder Has Metal Belt-Bed — Any belt speed up to 4000 ft. per min. is attainable for the wide range of purposes to cover which this equipment has been designed.

See page 31, column 3.

AT LEFT

Small Parts Cleaning in Continuous Movement—Re-handling or re-feeding for each cleaning operation is superseded, in this machine method, by continuous spiral feed into drum sections.

See page 31, column 1.



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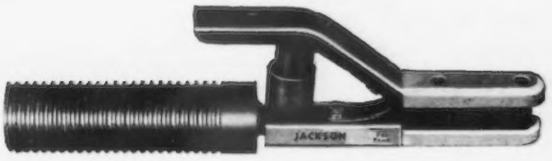
Stock Heating Machine Has Electric Eye Control — Feed and discharge, electrically actuated by the predetermined heat color of metal, provides automatic operation for this electric stock heating equipment.

See page 34, column 1.



ABOVE

The Jackson Electrode Holder Co., 174 Chalmers Avenue, Detroit, is marketing this insulated electrode holder said to possess insulation qualities which eliminate flashes.

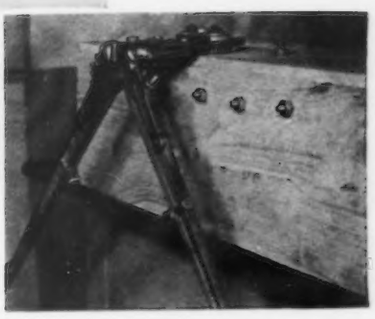
AT LEFT

New Gage Records Absolute Pressure — This new recording vacuum gage is compensated for changes in both barometric pressure and in temperature. The instrument can be furnished for low ranges.

See page 31, column 3.

Swivel Head Permits Angular Bolt-Clipping— Convenient attaching of a swiveling shoe, taken from a kit, serves to convert this maker's single purpose clipper into a tool which can be used from almost any angle.

See page 34, column 3.



Curved Milled Teeth Feature New File— A flat, standard cut, model one of 15 types which make up a new file line, is shown here.

See page 34, column 3

Stock Heating Machine Has Electric Eye Control

THE electric eye photo-cell tube functions as a color selector in the operation of the new Berwick electric, fully automatic, stock heater, built by the American Car & Foundry Co., 30 Church Street, New York. The equipment is pictured on page 33.

The pieces to be heated may be from 4 in to 19 in. in length and from 5/16 in. to 1½ in. in diameter. These pieces are placed in hoppers, located in the upright column members at either side of the machine, and are fed into position between the electrodes by a plunger finger which is adjustable for length and is indented to allow each end, of one piece only at a time, to drop into its indent for feeding. Pieces longer than 19 in. are fed by hand, after loosening eight bolts and removing the automatic feeding device, or special equipment can be installed for long lengths.

The electric eye can be set to operate at any desired heat as indicated by heat color selection recorded on the dial. After the color is determined, preferably by actual heat comparison, the dial is set at that color and the release mechanism operates at the color setting until such time as the dial is changed.

When released, the heated piece is chuted from the machine and the plunger finger automatically positions the next piece. The heater is equipped to operate on any alternating current voltage or cycle. The electrical consumption per hundred pounds of heat is dependent upon the temperature to which the pieces are heated; with ordinary stock, at 1900 to 2000-deg. heat, 18 kw.hr. per hundred pounds is said to be average. This covers the poundage of heated metal, not the total weight of metal.

Production capacity ranges from 1200 pieces per hr. on 5/16-in. diameter stock to 50 pieces per hr. on 1½-in. diameter stock, depending upon the length and degree of heat required.

Paint-Like Coating Has Rubber Base

"PLICOTE" is announced by the Watson-Standard Co., Pittsburgh, as a coating efficiently resistant to acids, alkalies, brines, oils and greases. The preparation is for application to metal, concrete, stone, masonry, wood and plaster, and contains resin composed principally of rubber hydrocarbon derived from crepe rubber, thus supplying a cover with some of the physical properties of rubber.

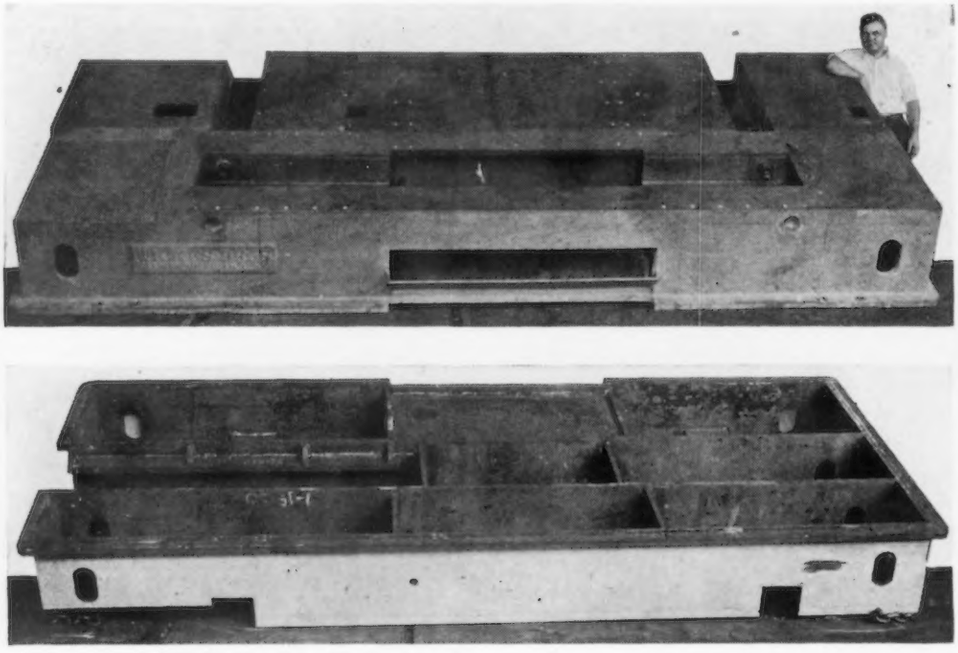
It is said that this covering does not permit fume or liquid penetration, that it is resistant to heat up to 300 deg. F. temperature, and that it will bake to a hard, glossy finish. Application is by spraying, brushing or dipping.

Swivel Head Permits Angular Bolt-Clipping

THE swivel head cutter, as pictured on page 33, of an otherwise standard Porter bolt clipper, serves to provide a universal tool for clipping bolt ends from almost any position. The cutter head is held in a shoe, joined to the clipper operating mechanism by a ball and socket joint and has a positioning spring to hold the head in any desired position. The shoe will hold any standard Porter head of a given size. The equipment is produced by H. K. Porter, Inc., Everett, Mass.

Curved Milled Teeth Feature New File

MILLED tooth files, announced by the Nicholson File Co., Providence, R. I., are produced with curved teeth, having a shearing rake. Resulting use is said to be particularly satisfactory on sheet metal work where curved surfaces must be filed. A wide range of the files is offered, including a flexible model for use between strips of molding, a square model for keyways and a half-round with teeth on the convex side only. The file is shown on page 33.



Heavy Lathe Has Welded Steel Base

PICTURED here are both top and bottom views of the base unit used in the construction of a large contour lathe described in THE IRON AGE of Nov. 15, 1934. The unit was fabricated from 1½-in. and 2- in. cross rolled steel plates. The overall length of the base is 17 ft.; the width 6 ft. 8 in.; the height 23 in. The rough weight is approximately 18,400 lb. The oil pan is built-in from ¾-in. steel plate after welding. The unit was thoroughly annealed in the plant of Wickes Brothers, Saginaw, Mich., the makers of the lathe, before machining operations were started.

Scrap Institute Condemns Direct Dealing; Members Divided On Export Policy

TO fight possible legislation against the exportation of scrap or not to fight such legislation was a question which almost disrupted the Institute of Scrap Iron and Steel, Inc., at its seventh annual meeting last week in New York. Inasmuch as exportation is still practically the only livelihood of many Eastern brokers, their efforts to sway Western colleagues into adopting a united front on the question were at times bitter, at times cajoling, and at times threatening. After about three hours of as intense debate as has appeared on any convention floor, the question remained unsettled, largely because there was no real issue at stake demanding immediate action.

Shipment to foreign mills of about 1,800,000 tons of scrap in 1934 has effected an almost complete withdrawal of low-priced material from the eastern Pennsylvania district. Consequently mills in that area as well as in the Pittsburgh district fear that prices will rise to excessive levels when their demands become heavier. No scrap dealer at the convention favored exportation if domestic mills were to find it impossible to obtain supplies because of foreign shipments. However, the contention of many brokers was that no mill has found it difficult to secure scrap at a price. It was also pointed out several times that quotations at Pittsburgh, which is indirectly affected, have remained in about their usual relation to Chicago quotations during the past year, although Chicago is not influenced by purchases for export.

Fear Embargo on Exports

The scrap industry, however, fears that some form of licensing or an embargo on scrap exports may be undertaken by the Government. Consequently those brokers interested in the continuance of exports desired a resolution instructing the institute to fight such legislation if it comes up. But the

PART of the Board of Directors of the Institute of Scrap Iron and Steel, Inc., which met in New York, Jan. 15 to 17. Reading from left to right, the board members shown here are Joseph Wilkoff, Louis J. Borinstein, Harry Grant, Barney Rubine, director general Benjamin Schwartz, board chairman Phil Frieder, Herman D. Moskowitz, Michael V. Bonomo, Darwin Luntz, Joel Claster, Thomas F. Kelly, J. W. Soloman.

dealers in the West who derive no benefit from exports bitterly assailed such institute action. They held that any moves in that direction should be taken by individual chapters without involving the institute as a whole.

The entire matter was finally referred to the board of directors. As there is no immediate danger that the Government will legislate against such foreign trade, it was generally assumed that if such a question should arise in Congress the institute would present the facts at its disposal and members would abide by whatever action might possibly be taken.

Direct Dealing Again Assailed

The second pertinent question coming before the assembly of scrap men was one of many years standing—that of direct dealing by steel companies to secure part of their scrap supplies. Joel Claster, Luria Brothers & Co., Inc., president of the institute, classed direct dealing as one of the most serious problems with which the scrap industry must contend. Mr. Claster stated that "when a steel company takes back scrap from one of its customers and pays more for it than a fair market price, it cannot be justified because it may involve a rebate on the price of finished steel. This may have the effect of nullifying fair competition among the steel mills in merchandising their own products."

It was claimed that mills purchasing scrap from customers do not inspect such material as rigidly as that which is obtained through brokers; also that reciprocal deals interfere with the law of supply and demand, and prevent a substantial tonnage of scrap being prepared by a dealer and made available in the open market to both large and small steel companies. It was stated that such action on the part of mills tends to foster monopolistic control over raw material to the detriment of smaller consumers of scrap.

"The time has come," continued Mr. Claster, "for constructive, concerted and aggressive action, requiring the united support of the entire scrap iron industry in the solution of this problem. We must know, once and for all, whether we are an essential industry or not. When the scrap is needed in time of emergency and the machinery for the collection and preparation of scrap has been disbanded, as the result of direct dealing and other practices, it will be too late to revive the industry."

Mr. Claster recommended "an intensive educational campaign among all who are interested in the scrap iron industry, and conferences with the important steel interests as soon as possible in order to arrive at a common basis of understanding in connection with the solution to the problem in the best interests of both the steel industry and the scrap iron dealers."

Favors High Wages

In conjunction with the general convention of scrap iron dealers, the industry's code authority also convened on several occasions to air the various difficulties encountered by compliance boards and to discuss the best procedures to follow when dealers knowingly or unknowingly commit violations of the code. The most important message delivered to the code group was contained in an address by Michael V. Bonomo, chairman of the national trade practice com-

Members of the scrap institute arguing the problems of the industry. This view is of the Jan. 16 session of

plaints committee for the scrap iron and steel industry.

The NRA code for the scrap industry provides for a minimum wage of 32½c. per hr. in the North and 27½c. in the South, thereby fixing the weekly wages of workers at about $13 in the North and $11 in the South. Mr. Bonomo was of the opinion that these wages were the least an employer should expect to pay labor, and stated that he "had no patience with the dealer who complains that this wage is working a hardship on his business. How can any dealer expect to compete fairly in the labor market with other industries of the country if he is not ready to pay as much as the other industries?

"Because of the nature of our business," continued Mr. Bonomo, "I believe cheap labor to be false economy. What we need most is strong, healthy, well fed labor; men who can do the work required in warm or cold weather, rain or shine, inside or outside. Some time ago I spoke to a dealer who complained very bitterly about the wages the code compelled him to pay, and of the tremendous compensation insurance he was paying, which was something like 25 to 30 per cent of his wages. During an inspection of his yard I saw the reason for his trouble. Most of his men were hungry looking, fingers and toes were sticking out plainly from under worn gloves and shoes, and their clothes and part of what were overalls were shoddy and in shreds. The yard was dirty and in disorder, and the equipment was antiquated and unfit for the proper operation of his yard. I found out later that most of the accidents to his men consisted of fingers and toes being smashed and cuts in the men's feet from nails and pieces of iron.

"It would pay that dealer dividends," said Mr. Bonomo, "if he raised the wages of his employees $5 a week. He would then have efficient and satisfied labor, and he would increase his tonnage per man-hour, and thereby reduce accidents and the cost of compensation. The minimum wages of the code do not work hardship on anybody, and my advice is to keep on increasing that minimum as the best way of solving our economic problems and of bringing contentment in our business."

The high rate paid by scrap dealers for compensation insurance, mentioned by Mr. Bonomo, has for many years been of considerable concern to the trade. Numerous efforts have been made to reduce the rate from levels around 25 per cent to a more equitable percentage. Only lately, however, has anything developed which would indicate that lower rates eventually might be secured. Both the Chicago and Boston chapters of the institute have worked intensively on this subject and Joseph V. Kiley, president of the Boston chapter, stated that New England members expected to secure rates around 8 per cent within the next month. This level is considerably lower than the 15 per cent rate dealers in the Boston district have been required to pay.

Institute Organization Revamped

At present the board of directors of the scrap iron institute is composed of 27 members who are intimately connected with the code administration, elect their own officers, nominate and elect new members to the board, etc. To change this situation, Phil W. Frieder, chairman of the by-laws committee,

session of the Institute of Scrap Iron and Steel, Inc., held at the Hotel New Yorker, New York City.

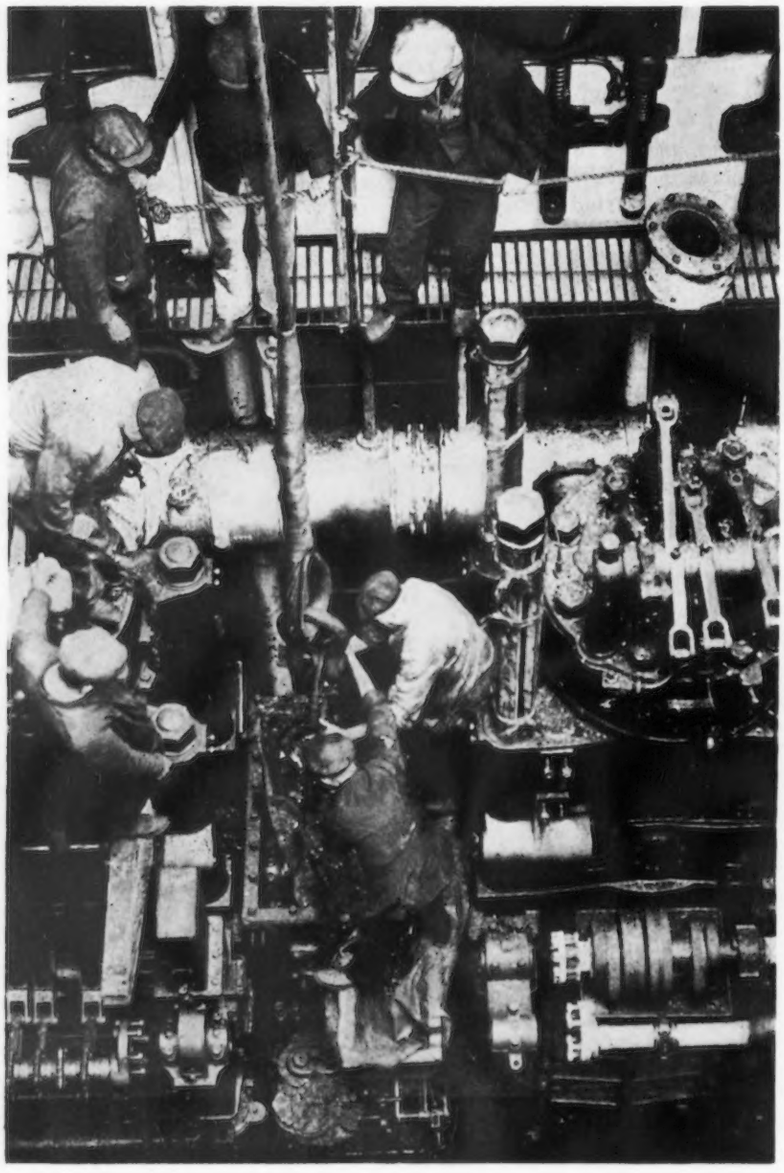
introduced a plan whereby the governing of the institute would be more democratic and more closely represent the voice of the entire scrap iron industry. This new plan was accepted by the convention, and it is expected that it will go into effect a year from now or at a mid-summer meeting, if such a meeting is held.

The plan calls for a reduction of the board membership from 27 to 19. The presidents of the 13 chapters of the institute, or some optional member of each chapter, will become members of the board. The remaining six members at large will be elected at each annual convention. Standing committees, under the chairmanship of members of the board, with power to select their own committees from the membership at large, would be appointed to cover the following departments of the industry: Legislative, relations with producers of scrap, problems of brokers, problems of large yard operators, problems of small dealers, finances, direct dealing, and other problems of the industry requiring consideration. It is expected that this plan, once in operation, will provide for more rapid and efficient solutions to the problems which constantly arise during the year.

Code Authority Members and Directors Named

During the convention the directors held an election to fill five vacancies in the scrap iron code authority, which will occur in April. The following were elected: Darwin Luntz, Luntz Iron & Steel Co., Canton, Ohio; Louis Borinstein, Indianapolis; Joseph V. Kiley, T. J. Kiley & Sons, Boston; Harry Grant, Grant Iron & Metal Co., Detroit; and Barney Rubine, Hudson Iron & Metal Co., Bayonne, N. J.

Also, in accordance with the bylaws of the institute, one-third of the board of directors are required to be elected at each annual convention. After the nominating committee submitted the names of nine men, the following were unanimously elected: Ben Cohen, Louis Cohen & Son, Wilkes-Barre, Pa.; L. J. Workum, Hickman, Williams Co., Cincinnati; Walter Erman, Erman-Howell Co., Chicago; Michael V. Bonomo, L. Schiavone & Bonomo Brothers, Jersey City, N. J.; P. W. Bowers, P. W. Bowers & Co., New York; H. Grant, Grant Iron & Metal Co., Detroit; Charles Dreifus, Charles Dreifus Co., Pittsburgh; Dan R. Cohen, D. R. & F. A. Cohen, Chicago; and H. Kirchmann, Alleghany Iron & Metal Co., Philadelphia. The accompanying picture shows the board of directors in session during the convention period.

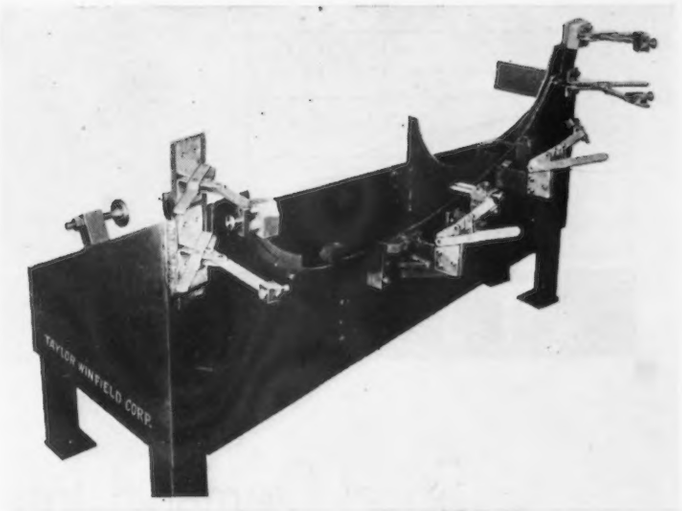


o o o

THE biggest marine job in London is now being carried out in King George V. Dock. They are lifting out one set of cylinders from the motor ship Laguna to get at broken crankshafts. Both crankshafts were fractured and sections of cylinders weighing 70 tons each have to be lifted out through deck to get the crankshafts out.

o o o

Cutting Set-Up Time on Assembly Fixtures



By FRANK McKENNA

Production Manager, Detroit Stamping Co.

o o o

A MAJOR problem confronting sheet metal production engineers is the elimination of stray costs which arise from incalculable forces, such as buckling of parts, and difficulties in handling. Numerous devices have been tried out for holding down work to insure alinement or to permit of the working out of succeeding operations as in the assembly of automobile bodies, refrigerators, etc.

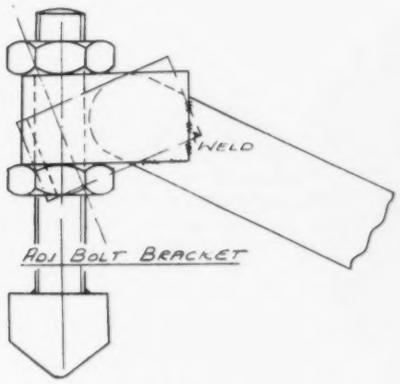
Perhaps the simplest way of alining two members is the use of pilot pins, locating either by holes in the part or by nesting at corners. When working with sheet metal, however, it is necessary to use additional means for holding the stampings or sheets against the form for the prevention of excessive buckling while welding, or to avoid the slippage of parts in riveting operation. The standard C-clamp is used frequently and is invaluable for short run jobs. Mass production set-up requires a clamping device that locates each and every time and it must embody ease and speed of handling.

Another work-holding device of clamp-action type has its place also in this work. This style of clamp is simple to make and to install and has a main advantage of price, but a disadvantage in that it is apt to fly open under sudden jar or impact.

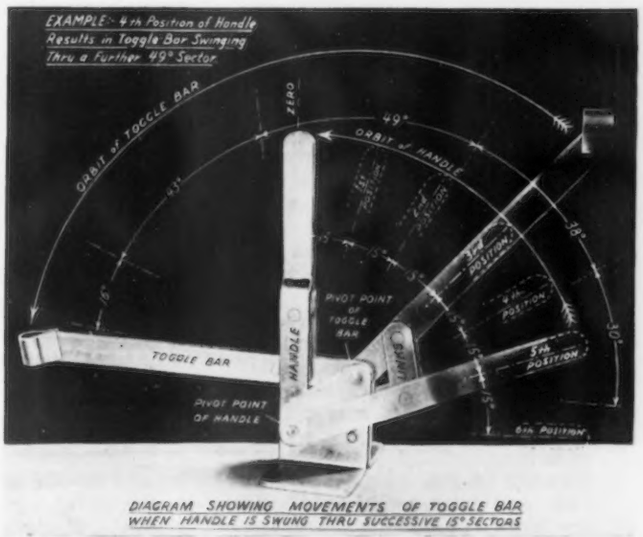
Well known among design and tool making organizations in Detroit and Philadelphia areas, is a quick-action clamping device known by various names such as "grasshopper," "rapid-action," or "toggle-clamp." Its mechanical principles have been known for years, but its common usage seems to have been adopted around 1920 when fabricated bodies for automobiles became a production factor in automotive plants.

The principle of this toggle clamp is that the handle and the clamping bar travel on two distinct orbits; the

(CONCLUDED ON PAGE 76)

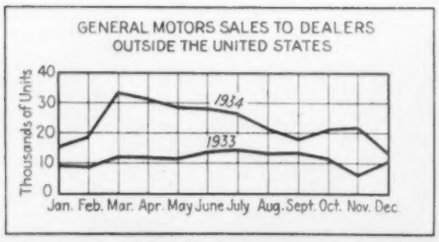


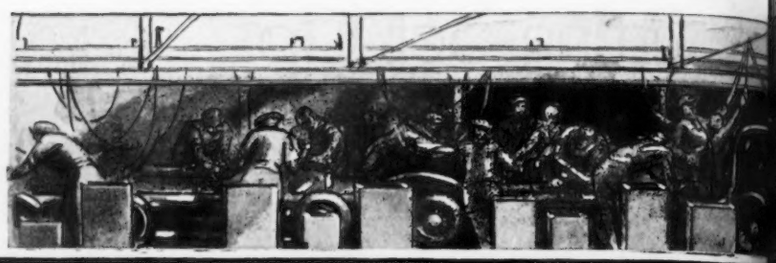
ABOVE
Illustration A



AT RIGHT
Illustration B

DIAGRAM SHOWING MOVEMENTS OF TOGGLE BAR WHEN HANDLE IS SWUNG THRU SUCCESSIVE 15° SECTORS





THIS WEEK ON THE AS

Steel Demand Intensified as Car Makers Step up Schedules

DETROIT, Jan. 22.

ANYONE who had the privilege of visiting an automobile plant in southern Michigan today probably would rub his eyes in wonderment and exclaim, "what's happened to the depression?" The answer is, "when a large number of orders came in the front door, the depression departed through the back door." The truth is that the depression is less evident in Detroit today than in any other section of the country.

The mad whirl of activities here is making itself increasingly felt elsewhere. Sheet and strip mills are booked ahead three to four weeks. Demand for wide sheets, used for body quarter panels and Fisher's turret tops, has been so strong that the few steel companies which can make them are virtually sold out for the current quarter. Stainless steel orders, particularly for cold-rolled strip, have been heavy and mills cannot make deliveries in less than three weeks.

It has been years since Ford's steel buying has been on the present extended scale. Ford has spread out its tonnage among a much larger number of mills than normally and in some cases has asked steel companies to ship everything they can possibly roll immediately. It also is requesting steel mills to load freight cars and trucks to full capacity because of limited unloading facilities just now at Dearborn. Ford's releases the past week have included impressive tonnages of forging steel for its suppliers and sheets for its body builders. Ford's purchasing department is working at top speed in an effort to keep abreast of the requirements of the production departments.

Ford attained its all-time peak in late model T days when it made well over 8000 cars a day. Yet it is now talking in terms of trying to turn out 180,000 units in March as well as 140,000 in February. Such schedules would necessitate an operating rate of around 8000 units a day. It sounds unbelievable, but Ford's tentative plans call for 430,000 cars and trucks in the first quarter. The whole industry produced only 362,832 units in the same quarter a year ago and 373,247 units in the first quarter of 1932.

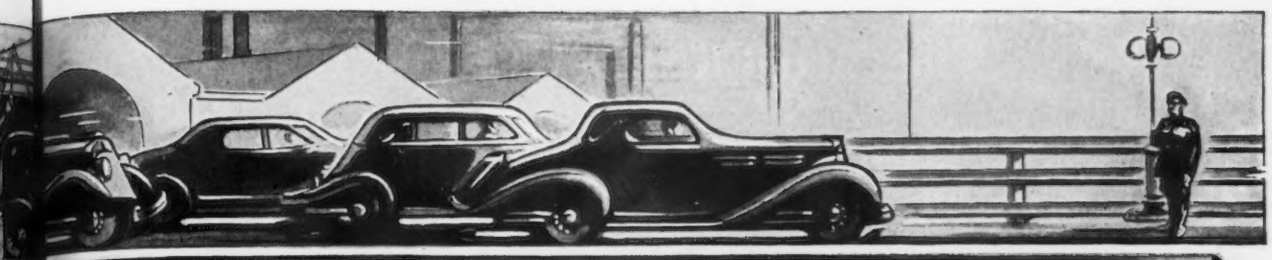
While Ford is working at Rouge five days a week, some of its suppliers, such as Briggs, are taking advantage of the opportunity of using Saturday to catch up on Ford's specifications. The new body department at Dearborn is now building two-door sedans. Trouble in connection with certain presses has made it essential to have Briggs temporarily stamp certain large body parts in addition to furnishing parts and bodies on regular contracts.

Chrysler, in all its divisions, is taking in as much material as suppliers can ship. It still is understood to be committed to a program of 90,000 cars this month and 100,000 in February. General Motors also has ambitious plans. Chevrolet is reported to be working on a basis of 245,000 units for the entire first quarter. It is still shy of Master DeLuxe models, even for display purposes. It won't get into volume production on the Master until next month.

Outside the lowest-priced field, two cars which have received wide acclaim are the Pontiac and Oldsmobile. Pontiac will make about 13,000 cars in January and 15,000 in February. In the first four months of 1935 it expects to build around 60,000 jobs.

Many automotive parts plants are working six and even seven days a week. Pig iron shipments this month to automotive foundries are running 20 per cent better than in December, despite the fact that some consumers are liquidating stocks accumulated last June and heretofore held in reserve. Certain foundries are operating six days a week on multiple shifts.

Only one cloud looms on the automotive horizon—the possibility of strikes early in March, or perhaps sooner. The American Federation of Labor appears to be spoiling for a fight. It is understood to be planning on the formulation of a set of demands which, on the authorization of local automobile unions meeting jointly in executive session, will be presented simultaneously to a number of automobile companies. Apparently the procedure will be much the same as that followed a year ago in connection with the threatened general automobile strike. It is probable that the plants singled out for the presentation of demands will be those which, if production stopped, soon would cripple other plants dependent on them for parts.



ASSEMBLY LINE

By BURNHAM FINNEY

Detroit Editor, The Iron Age

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F. J. Dillon, the federation's general organizer at Detroit, is conferring with President William Green in Chicago regarding an increase in the number of organizers in the motor car industry. Mr. Green will spend a week in February addressing mass meetings in southern Michigan, ending with a meeting in Detroit on Feb. 23 which will be broadcast over a nation-wide hook-up. The general impression in Detroit is that recent elections held by the Automobile Labor Board have put the federation in a tough spot. In every case an overwhelming majority of workers have failed to write in on their ballots their preference for any labor organization.

With the automobile industry an almost indispensable cog in the recovery machine today, it is believed that the Roosevelt Administration will not let labor get too far out of hand and spoil what Detroit is doing for the nation in infusing new life into a number of industries through widespread orders for materials and parts. On the other hand, the federation unquestionably is on the defensive and must do something in order to retain a place in the automotive industry. How much strength it could muster in case of a strike is problematical, but probably is far less than it was a year ago.

These are anything but pleasant days for the managements of automobile companies, since all of them (with the exception of Mr. Ford) must answer to stockholders. Operating under cover, a group of stockholders in independent car companies are reported to have formed the Automobile Stockholders Consolidation Committee, Inc., for the purpose of forcing a merger of practically every important company outside the Big Three. The plan is said to contemplate exchange of stock in present companies for shares in a holding company. Present managements have nothing to do with the scheme and disclaim knowledge of it, but they probably are worrying a bit over what might happen in view of forced changes at Hupmobile in recent months which dislodged the old management.

On Feb. 1 William B. Stout will announce his new rear-engine car which, it is said, will be known as the Stout Scarab. It embodies principles of airplane construction never before applied to motor cars, is powered by a Ford V-eight engine and, despite its roominess, is no longer than a Ford. Production this year will be on a very limited basis.

Car manufacturers are virtually sold out until April 1. It is estimated that production during the first quarter will be more than 1,000,000 units, compared with 749,532 in the same quarter last year and 1,046,689 in 1930, the last year in which output in the first three months passed the million mark.

Revised estimates put assemblies for January at 275,000 units. Retail demand is strong with indications that pasesnger car sales this month will double those in January a year ago when retail deliveries totaled 61,242 units.

Plymouth set an all-time record last week when 11,730 cars came off its assembly lines. Ford's February schedule is the largest since June, 1930.

Automobile week in Detroit proved a huge success, with the annual conventions of the Society of Automotive Engineers and of the National Automobile Dealers' Association as well as the Detroit Automobile Show going on. Dealers aired their grievances, voicing severe criticism of factories for selling cars to their own employees at substantial discounts.

Detroit Notes

Ford is reopening branch assembly plants at Memphis and St. Paul, which were closed late in 1932. Plants at St. Louis and Long Beach, Cal., were also put into operation again recently. . . . New Garford trucks, built by Consolidated Motors Corpn., Lima, Ohio, are the first cars to be built with independent springing for all four wheels as developed by the Leaf Spring Institute and with the double wishbone type of frame pioneered by Midland Steel Products Co. . . . C. L. Cummins, Columbus, Ind., manufacturer of Diesel engines for trucks, has announced that he will introduce shortly a Diesel-engined passenger car. The six-cylinder engine is said to have a piston displacement of 300 cu. in. and its performance is claimed to be on a par with that of present gasoline engines. Negotiations are reported under way with an established manufacturer to furnish the chassis for the new cars.

R. H. Grant, vice-president in charge of sales, is a growing power in General Motors' ranks. . . . Despite all the lip service given the retail automobile code by factory executives the past week, it is no secret that mention of the code in certain high places in manufacturing circles evokes biting private comments. . . . Great Lakes Steel Corpn. last week blew in its blast furnace which has been rebuilt by Arthur G. McKee & Co. . . . Ford is still getting a considerable volume of V-eight cylinder blocks from Campbell,Wyant & Cannon at Muskegon. . . . All Ford cast crankshafts and camshafts, however, are being made in the Ford foundry at Rouge. . . . Attendance at the New York Show was off from last year's figure largely on account of less advertising support from the factories.

THE HANDS *of* MODERNIZATION

reveal the Tolls Obsolescence exacts from Industry

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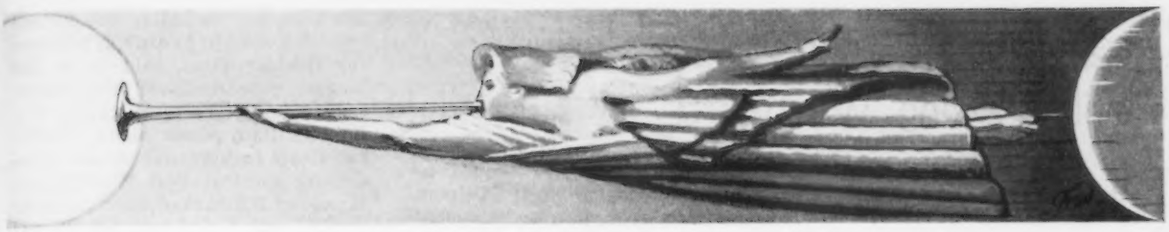
In addition Dual Speed Range and Double Index Feature when required.

For Lower Costs and Increased Profits consult Bullard Engineering service about Type "J" as applied to your small high speed jobs.

THE BULLARD COMPANY
Bridgeport, Connecticut



NEWS OF THE WEEK

Employees and Customers of Steel Industry Opposed to 30-hr. Week

PROPOSED legislation for a 30-hr. week in industry is arousing opposition in the steel industry as well as among consumers of steel, according to reports reaching the American Iron and Steel Institute. Steel mill employees are reported to be generally against the measure because they fear it will result in a reduction in weekly earnings or in freezing those earnings at existing levels.

Management of the steel industry is fearful that the difficulties attendant upon six-hour day operation would be unsurmountable, and would cause contraction of markets.

Consumers of steel view the measure as certain to make for substantially higher prices of steel products. It is estimated, for example, that had a 30-hr. law been in effect during 1934, the added direct labor cost of making steel would have been more than $100,000,000. Because of the large deficits indicated for 1934, the added wage cost would necessarily have been added to prices. In addition to the direct cost, there would be an increase in cost of all materials and commodities used in the production of steel.

Reduced Mill Efficiency

The increase in costs would result not only from higher wage rates but also from reduced efficiency in mill production; the necessity for four shifts in continuous operations; the impracticability of applying the six-hr. day in single-shift operations; increased costs in overhead, supervisory forces, and by reason of enhanced prices of raw materials and every commodity the manufacturer has to buy.

Increased steel making costs would be reflected in higher prices of automobiles, refrigerators, kitchen stoves, and all of the wide range of consumer products as well as all other types of goods made from steel.

The volume of steel orders in 1934 was only sufficient to provide three-quarters of full-time employment under the existing 40-hr. maximum week allowed under the code, so that the average man put in only 29.7 hr. per week. Had this volume of work been shared by the greatly increased number of workers necessary to operate the mills at capacity on a 30-hr. week basis, the individual employee would have averaged no more than 20 hours.

Steel mill employees also fear it will have the effect of further spreading or sharing of work. The steel mill worker realizes that the establishment of a 6-hr. day and 5-day week, universally applied in all mills, factories and manufacturing establishments of every nature through the country, would adversely affect his interests, in common with all other classes, because it would materially increase the prices of everything he has to buy and use. The effect on him would be a substantial cut in his real wages, below levels which the steel industry holds necessary for decent American living standards.

The steel industry took the lead early in the depression in the "share-the-work" movement. Subsequently, during the first year's operation of the steel code, the industry added 73,000 employees to its payrolls and increased its outlay for wages by $95,000,000. Three wage advances were put into effect during the 12-month period.

In June, 1934, when operations were at 53 per cent of capacity, the total number of employees was 99 per cent of the 1929 average.

Would Benefit Foreign Producers

Any further artificial addition in steel producing costs would serve to increase the disadvantage under which the industry is now operating in comparison with foreign steel producers. Recent data show that hourly wage rates in the steel industry in the United States are from 120 to 650 per cent above the average hourly rate for similar labor in foreign countries. As a result of this, a great deal of foreign steel is being imported into this country and sold at prices which American producers cannot meet. Imposition of the 30-hr. week on the industry would increase this competitive disadvantage and act as a boomerang upon American workmen, through the loss of markets for American steel and consequent loss of jobs for steel workers.

No foreign country has reduced hours to anything like those now prevailing in the United States, and any further reduction here would still further handicap this country in world markets. In the fall of 1932, employees of blast furnaces in Great Britain, for example, were working 8 hr. a day, seven days a week.

Since the first of the current year, mill operations have advanced sharply which means more work and higher earnings each week for each employee. Any legislation which will halt this trend toward fuller pay envelopes is not expected to find favor among steel mill employees.

Engineering data designed to simplify the selection of rubber belting, hose, and other mechanical rubber goods for industrial service are contained in a 21-page, 8½ by 11-in. booklet, published by the B. F. Goodrich Co., Akron, Ohio. The booklet also describes more than 200 rubber items, and includes 100 different diagrams and other illustrations.

Geographic Center of Steel Industry Is Still Moving Westward

THE geographic center of ingot capacity of the steel industry in the United States is in Crawford County, Ohio, north and west of the town of Crestline, according to a calculation made by the American Iron and Steel Institute.

Capacity for producing steel ingots by the Bessemer and open-hearth processes is evenly distributed around this point, which is the center of gravity of the steel industry. The great concentration of capacity in Pennsylvania and eastern Ohio is balanced by the capacity on the Pacific Coast, some 2500 miles westward, and by the mills in the Chicago district.

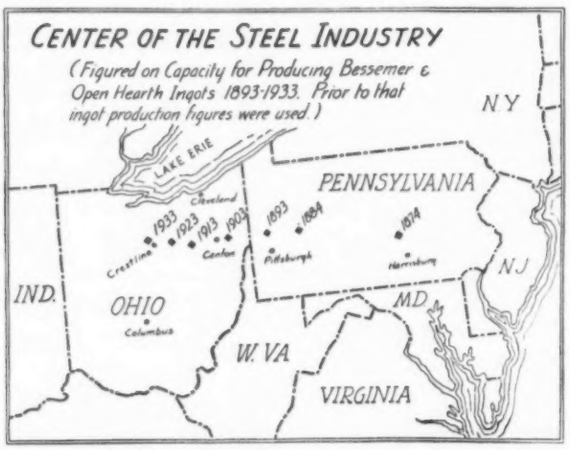
Since 1874, the earliest year for which the institute finds records available, the center of the steel industry has moved steadily toward the West. Since 1913, the westward movement has been along a nearly straight line across Ohio.

This westward movement of the center of the steel industry closely resembles a similar shift of the center of population of the country. Since 1870, the center of population has moved 190 miles to the West, from a point 48 miles east of Cincinnati to a location in Greene County in the southwestern part of Indiana. The center of the steel industry, as reflected in ingot capacity, has shifted more rapidly by traveling westward approximately 350 miles from its location in central Pennsylvania since 1874.

In 1923, the center of steel-making capacity was in Ashland County, Ohio, near Hayesville. In 1913, the center was in Wayne County between Orville and Apple Creek, Ohio.

Ohio was able to claim the geographic center of the industry in 1903 when the center moved to Columbiana County, near Millport and Lisbon, from its previous location in 1893 near Butler, Pa.

For 1884 and 1874, records of ingot capacity are not available; according to the institute, but reports of actual production of steel ingots in those years place the 1884 center in Armstrong County, Pa., near the hamlet of Echo, not far from Kittaning. In 1874, the center of steel ingot production was close to Oriental in Juniata County, about 30 miles north and west of Harrisburg.



Allis-Chalmers Holds Open House Jan. 19

GEN. OTTO H. FALK, chairman of the board, and Max W. Babb, president, Allis-Chalmers Mfg. Co., Milwaukee, were personal hosts on Saturday, Jan. 19, at an "open house" at the main works in West Allis, to more than 25,000 registered guests, including industrialists from all over the Central West, technical groups, students in technical educational institutions, employees and their families, retired and other former employees, and others. It was probably the first open house on this scale in American industry. Employees and former employees were entertained from 9 a.m. until noon with an inspection of the works and products. At noon a large luncheon was given for the press in the Allis-Chalmers clubhouse, and from 1 to 4 the other guests were entertained.

The various departments cooperated in showing outstanding products, from the smallest "Texrope" drive weighing a fraction of a pound, to a steam turbine weighing 860 tons, and including the following: 115,000-hp. hydraulic turbines for Boulder Dam, said to be the largest ever designed and manufactured; electrical switchgear for Boulder Dam power plant; 80,000-kw. steam turbine unit for new generating plant at Port Washington, Wis., for Milwaukee Electric Railway & Light Co., to cost $25,000,000 when all units are completed.

Large roller gates for control of navigation and floods in upper Mississippi River lock and dam project of United States Government; all of the machinery necessary to produce wheat from soil to flour. A demonstration of man-made lightning, 2,000,000 volts; the latest farm and industrial power machinery; display of electric motors, centrifugal pumps, rotary compressors, transformers, rock and ore crushing machinery.

The inspection of the manufacturing, testing and research facilities revealed some of the unusual equipment employed, including a boring mill said to be the largest in America; a casting washing machine, consisting of a large concrete vault in which castings are placed on a revolving table, with water at 450 lb. pressure forcing sand cores out; castings and parts up to 40 ft. 4 in. in diameter and 16 ft. high being bored and turned; cranes said to be the largest in the vicinity handling extra heavy pieces weighing up to 120 tons; crushers taking a 25-ton fragment of rock, crushing at the rate of 1000 tons an hour.

Fabricated Bookings Drop in December

FABRICATED structural steel showed a marked seasonal decline during December, according to the reports received by the American Institute of Steel Construction from shops representing 68 per cent of the industry. Bookings during that month were approximately 40 per cent less than the average for the first half of the year, and 44 per cent less than for the same month of 1933.

Shipments, while less than for the past few months, were 14 per cent greater than the average for the first half of the year, and 27 per cent greater than for the same month of 1933. Bookings held for future fabrication are today approximately 25 per cent less than at this time last year.

Eavenson, Alford & Hicks, mining engineers, are now located in the Koppers Building, Pittsburgh, having moved on Jan. 14 from the Union Trust Building.

British Iron Demand Quiet with Steel Prospects Brightening

LONDON, ENGLAND, Jan. 21 (*By Cable*).—Pig iron is quiet with further additions to stocks being made. Substantial contracts are held and an early buying revival is expected in view of consumers' activity. Hematite home sales are only in small parcels as consumers are well covered, but better exports are reported notably to Scandinavia and Italy. There is a marked improvement in ferro-manganese demand; 12,000 tons was recently shipped to Australia.

Steel orders are below expectations but the works are busy on old contracts and good inquiries are circulating. The future outlook is bright as numerous shipbuilding orders are being placed and more are anticipated. The railroads are placing orders for track construction and engineering improvement and early revival in the building trades is expected.

Tin plate production quotas are being reduced from 75 to 55 per cent of agreed capacity and the market is quiet awaiting the effects thereof. Italy has definitely joined the international agreement and subsidiary agreements have been arranged with Norway.

Continental iron and steel demand is more quiet but there is a better undertone in view of the improved political outlook and the French and Belgian credit reform plans.

Demand for finished steel is fairly satisfactory but semi-finished is dull. Active demand is coming from South America, notably Argentina, but other markets, particularly the Far East, are dull.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hrth.	£5 10s. to £5 15s.
Tin plate, per base box	*18s. 2d. to 18s. 9d.
Steel bars, open-hearth	£7 17½s.
Beams, open-hrth.	£7 7½s.
Channels, open-hearth	£7 12½s.
Angles, open-hearth	£7 7½s.
Black sheets, No. 24 gage	£9 5s.
Galvanized sheets, No. 24 gage	£11 5s.

*To May 1; 18s. 5d. to 19s. thereafter.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange

Billets, Thomas	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plate, ¼ in. and up	£4
Plate, 3/16 in. and 5 mm	£4 2s. 6d.
Sheets, ⅛ in.	£4 7s. 6d.
Beams, Thomas	£3 2s. 6d.
Angles (Basic)	£3 2s. 6d.
Hoops and strip base	£4 2s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.

OBITUARY

FRANK G. WRIGHT, formerly vice-president of the Ohio Steel Foundry Co., Lima, Ohio, died of heart disease at his home in that city on Jan. 11, aged 63 years. Mr. Wright was born in Oldham, England, and came to this country in 1874. Before becoming identified with the Ohio company, he was manager of the Indiana Harbor plant of the American Steel Foundries until 1912.

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ARVID FORNELIUS, manager, steel mill, Athenia Steel Co., Clifton, N. J., died on Jan. 4. He was the son of the founder of the Athenia company.

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HORACE R. CULLING, vice-president and manager of the Carondelet Foundry Co., St. Louis, with which he had been connected 46 years, died in that city. He was born 66 years ago in England, and came to America as a youth. C. R. CULLING, a nephew is superintendent of the foundry.

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NEVILLE A. KELLY, eastern sales manager, Universal Portland Cement Co., a subsidiary of the United States Steel Corpn., died at his home in Forest Hills, Long Island, N. Y., on Jan. 16. He was 51 years old. He had formerly been associated with the Universal company's Pittsburgh office, and for the past 15 years in the company's New York office.

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BERNARD E. PRATHER, assistant superintendent of erection, Allis-Chalmers Mfg. Co., Milwaukee, died Jan. 17 of heart disease. He was 50 years of age.

JOSEPH G. SAILER, prominent industrialist of Menasha, Wis., died Jan. 12 after an operation for appendicitis. He was born in Appleton, Wis., Oct. 4, 1866, learned the machinist and foundry trade and became associated with Mockley Brothers & Sailer in Menasha in 1899. Later he became a partner in the Sailor-Whittmore Machine & Foundry Co. there. Mr. Sailer retired a number of years ago.

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HENRY SLYH, vice-president and general manager of the Louisville Bridge & Iron Co., Louisville, Ky., died of heart trouble at his home there on Jan. 11, aged 63 years. He had been connected with the company for 37 years.

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GEORGE A. MANN, vice-president and sales manager of the Wirthlin-Mann Co., Cincinnati, manufacturers of mill supplies and transmission machinery, died in that city on Jan. 10, aged 61 years. He had been identified with the company for 20 years.

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THOMAS M. PHILLIPS, formerly superintendent, wash metal department, Brier Hill Steel Co., died at Youngstown, on Jan. 16 after a prolonged illness. He began his career in the steel industry when he was 18 years old, having started on a 12-in. rolling mill. In 1889 he built and operated a puddling furnace at Pueblo, Col. He became associated with the Youngstown Steel Co. in 1895, and when the company was merged with the Brier Hill Steel Co. he continued with the latter concern. In 1919 he became manager of the American Puddled Iron Co., Warren, Ohio, which position he held until he became ill three years ago.

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WILLIAM H. DOTTER, president, Frog Switch & Mfg. Co., Carlisle, Pa., died on Jan. 19. He was 69 years old.

Texas College to Hold Welding Conference

A CONFERENCE, the first annual, on developments in electric and oxy-acetylene welding will be held at the Texas Technological College, Lubbock, Texas, Feb. 14 and 15. Manufacturers and jobbers of welding equipment are invited to display their products. Lectures, motion pictures, and actual demonstrations of all classes of welding are planned. Prof. H. F. Godeke, department of mechanical engineering, is in charge of arrangements.

PERSONALS

GEORGE L. DANFORTH, JR., has resigned as general superintendent of South works, Illinois Steel Co., to become president of the Open Hearth Combustion Co., Chicago, effective Feb. 1. He has been connected with the steel industry for 37 years, having started in the open-hearth department of the Birmingham Rolling Mill Co. in August, 1897. He has been with the South works organization since 1903 as superintendent of steel production, as assistant general superintendent, and as general superintendent since November, 1929. The Open Hearth Combustion Co. was organized by Mr. Danforth and the H. A. Brassert Co. in 1924 and controls the Danforth patents as well as those covering the Naismith sloping backwall.

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WILLIAM E. CORRIGAN, who has been identified with the American Locomotive Co., New York, since 1909, has been appointed assistant vice-president Railway Steel-Spring Division, and will have charge of the sale of springs, tires and appurtenant parts.

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SYLVESTER A. MAHAN has been made works manager of the Philadelphia plant of the Edward G. Budd Mfg. Co., and JOSEPH W. MEADOWCROFT, assistant works manager. EARL BLAINE has become chief inspector.

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BLAINE G. WILEY, advertising manager of the All-Steel-Equip Co., Inc., Aurora, Ill., has been appointed assistant general sales manager. He has been identified with the company since 1923.

CHARLES H. RHODES, new director of purchases of the United States Steel Corpn., whose appointment, was noted in these columns last week.

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GEORGE MCM. GODLEY, who has been for many years a member of the board of the Burden Iron Co., Troy, N. Y., has been elected president of the company, succeeding the late William E. Millhouse.

G. L. DANFORTH, JR.

GEORGE E. OSBORN, who as announced in these columns last week has been appointed vice-president and general manager of the Lamson and Sessions Co., Chicago, western subsidiary of the Cleveland company of the same name, and George S. Case, Jr., assistant general manager of the Chicago subsidiary.

A. P. MUNNING, who is a member of the board of directors of the Hanson-VanWinkle-Munning Co., Matawan, N. J., and who retired from active participation in the affairs of the company in 1930, has again become actively associated with it. He will occupy a high executive position and will devote himself to the larger and broader aspects of the business. There will be no change in the officers or directors of the company.

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RALPH H. CLORE, formerly general sales manager of the United States Electrical Tool Co., has been appointed general sales manager, effective Feb. 1, of the Medart Co., St. Louis. He succeeds F. P. KOHLBRY, who has resigned to assume active charge of the Machinery & Welder Corpn., Chicago.

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WILLIAM R. ELLIOT has been placed in charge of operations of the Otis Steel Co. in Cleveland, having been given the title of assistant to the vice-president and general manager. He has been connected with the Otis company since 1925 in various capacities, recently as manager of the production department. THOMAS C. PERKINSON has been appointed general superintendent, succeeding the late Russell L. Davis. He has been with the company in various capacities since 1925 and more recently as assistant superintendent. EDGAR WIEGAND has succeeded Mr. Elliot as manager of the production department.

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JOHN L. PERRY, vice-president of the American Steel & Wire Co., who becomes president of the Tennessee Coal, Iron & Railroad Co. on Feb. 1, was in Birmingham last week on an inspection trip. While in Birmingham he visited various operations of the company, conferred with officials and department heads, and was tendered a dinner at the Mountain Brook Country Club, which was attended by officials of the company.

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WALTER S. TOWER, executive secretary of the American Iron and Steel Institute since October, 1933, has been reelected to this office by the directors of the institute. Under the new organization of the institute, announced recently upon the election of EUGENE G. GRACE, president Bethlehem Steel Corpn., as president, Mr. Tower will serve as the active executive officer of the institute. He has had long experience in the steel industry. Before joining the institute, he was head of the commercial research department of the Bethlehem corporation.

THIS WEEK IN WASHINGTON

Steel industry has no representative at price control hearings because code has no provisions directly under fire.

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Hearings on NRA employment policies to begin Jan. 30 with clarification of seven major points scheduled.

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Recovery board chairman would give NRA another trial with a one or two-year extension.

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New Deal actually seeks aid of business when Secretary Roper asks business planning council for ideas on pending legislation.

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By L. W. MOFFETT

Resident Washington Editor, The Iron Age

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WASHINGTON, Jan. 22.—Even if the nation's capital was in a frigid climate, there would be no danger of the Potomac's freezing over. The city is constantly enveloped with a blanket of warm air arising from the uninterrupted hearings and investigations which go on from day to day. A major fact-finding undertaking has just come to a close, but another begins early next week. Many other things of more or less importance are happening, and then, of course, the Congress is in session.

Ford vs. Blue Eagle

The Ford Motor Co., persistent code holdout, may not have knocked the Blue Eagle out, but it certainly has the doughty old bird down. Otherwise what interpretation is to be put on the NRA order giving authority to Government agencies to buy repair and replacement parts for those Ford automobiles and trucks owned by the Government without requiring certificates of compliance? Call it eating crow or what you will, Compliance Director Sol Rosenblatt said the order was issued so that "the Fords now in service may be used without interruption and does not have any bearing on the question of compliance certification on new purchases."

Record Talk at Hearing

Verbosity at the NRA price hearing reached a high pitch, despite the fact that each speaker was supposed to say his piece in 15 min. The complete four-day session is recorded in volumes totaling 1839 mimeographed pages, estimated at about 500,000 words. In addition many briefs were filed. And this was only the first of a series of hearings NRA is holding on major code provisions.

Industry's Terrific Beating

That industry took a terrific lacing in the way of monumental losses during the depression was strikingly shown by Leon Henderson, director, NRA Research and Planning Division. He presented figures at the recent price hearings which were of breath-taking variety relating to 1932 only. He quoted from an economist, who cited the experience in that year of 508,000 corporations. The figures showed: Total valuation about two-thirds of national valuation of the country's assets; net loss $5,643,000,000; seven-cent loss on every dollar of sales; corporations having loss experience lost 15c. on the dollar; paid out additional $4,000,000,000 in dividends; paper surplus at end of 1932 for all corporations reporting to the Bureau of Internal Revenue showed reduction of $9,671,000,000, exclusive of impairment of assets which has been brought about by resultant decline in earning power.

Piling up even much greater figures, the anguish was strongly emphasized by Henry S. Dennison, Dennison Mfg. Co., Framingham, Mass.

"In spite of the sad loss of the nine billions," said he, "the loss of the great body in this country that we must all depend upon, the labor group, must have been from three to four times as great."

"No wonder industry in general

was thinking in terms of price stabilization!" exclaimed Mr. Henderson.

New Deal Seeks Business Aid

It's a far cry from the President's Green Bay, Wis., speech of last August when he figuratively gave big business a trouncing to the White House conference of last Thursday when arrangements were made for a plan of cooperation between the Administration and industry. The Business and Advisory Planning Council, consisting of 52 prominent industrialists, has been selected as the medium to transmit to the Administration industry's views on pending legislation.

Secretary of Commerce Roper organized the council more than a year ago to advise him on matters affecting commerce. The Secretary said that "any business man or organization desiring to be heard on any piece of pending or proposed legislation may get a hearing through the council."

Already the council has set up a committee to consider plans for developing credits for small enterprises. Among its members is Harold C. Smith, president, Illinois Tool Co. Included in the membership of the advisory council is Myron C. Taylor, chairman, United States Steel Corpn.

The Administration's attitude toward business in seeking the latter's feelings on legislation would indicate realization that there can be no recovery without aid from industry. If the Administration wants views of business on all legislation that has been introduced in the current session, the market for asbestos paper is due for a sharp upturn.

Propose Ship Subsidy Change

Headed by James A. Farrell, former president of the United States Steel Corpn., a special committee on merchant marine of the Chamber of Commerce of the United States has made a report proposing that carriage of mails in American ships be paid on a poundage basis. The report, made to the chamber's board of directors, preliminary to recommendations for legislation, suggests that the subsidy be granted to American-built vessels used in establishing and maintaining regular service on essential trade routes between the United States and foreign ports, but preferably not to more than one line in the same trade route. The committee says the fact that the present system of Government aid to the merchant marine seems to link such aid to the carriage of the mails has caused a great deal of misunderstanding in the public mind. The misunderstanding relates to the service which the payments cover and this in turn, the committee says, has brought about much uncertainty within the shipping industry.

Urges Grade Crossing Elimination

Earmarked Federal funds for use in grade crossing elimination work have been proposed by a committee of the United States Chamber of Commerce. The committee says the work, recommended as an unemployment relief measure, is a logical part of the highway program and that in the past undue burdens have been placed upon the railroads in eliminating grade crossings. The program is also urged by structural steel interests and, if carried on on the extensive scale suggested by the chamber, would call for a large tonnage of steel. The committee says there are at present approximately 237,000 rail-highway grade crossings in the United States of which 4700 are protected by gates, 6200 by watchmen and 20,000 by signals. The remainder are protected only by fixed warning signs.

Will Push 30-hr. Week

One of the first pieces of legislation that its proponents are going to push vigorously as soon as President Roosevelt discloses his recovery program in full involves the 30-hr. week. Heretofore Administration officials, out of sympathy with the measure, have felt confident of their ability to defeat it. But polls taken in Congress are said to show that the measure can be passed and that it might not be possible to kill it with a Presidential veto. Administration supporters, however, say the bill—in fact two bills, one by Senator Black of Alabama and the other by Representative Connery of Massachusetts—can be squelched in the House. Apparently it is believed this can be done through parliamentary moves.

Previously the Black bill passed the Senate and with a more radical Senate than ever—this also goes for the House—it apparently can get through the so-called "upper house." Organized labor in insisting upon the legislation and its emphasis on unemployment, now estimated at almost 11,500,000, with a chance of an absorption of not more than 1,000,000 before the Public Works program starts, is having its effect on some heretofore opposed to the bill. Of course it is having its effect on opponents of the legislation, including industrialists, who are again stressing the fact that the bill will add to unemployment. It simply would put upon industry a burden it could not stand. It would be the straw that broke the camel's back.

And on top of this move for the 30-hr. bill for labor generally the railroad brotherhoods are demanding the 30-hr. week for the railroads, flying in the face of the declaration of Joseph B. Eastman, Federal coordinator of transportation. Mr. Eastman, certainly strongly sympathetic toward labor, has said the carriers could not stand the burden. But the brotherhoods are going to try to jam the law through Congress.

Further evidence of a truce between capital and industry!

PWA Allotments Are Announced

WASHINGTON, Jan. 22.—Awards may be made within a fortnight for the first units of Chicago's metropolitan sewage disposal plant, and will include 4000 tons of reinforcing and miscellaneous steel and 2115 tons of cast iron pipe and fittings, according to Harold L. Ickes, public works administrator. The new contracts will total $21,646,000 and are scheduled for the coming months, the work to be financed by PWA.

PWA has asked for bids on a Federal slum clearance and low-rent housing project known as the University housing development at Atlanta, Ga., to accommodate 675 negro families. It has allotted $2,100,000 for the project. Mr. Ickes also has announced an increased allotment of $900,000, making a total of $1,500,000, for expansion of the Reedsville, W. Va., experimental community being developed by the Division of Subsistence Homesteads.

The PWA has also announced a loan of $2,350,000 to the Wabash Railroad to be used to complete a new bridge across the Missouri River at St. Charles, Mo. It was stated that work can be begun immediately and will be finished within a year. Allotment of $680,000 also has been made to the Smithsonian Institution for the construction of buildings at the National Zoological Park in Washington.

Among other allotments made by PWA are the following: DuQuoin, Ill., $466,000, for sewers and waterworks improvements; Bessemer, Ala., $250,000, for school building; Eugene, Ore., $350,000, for library building; Warm Springs, Mont., $400,000, for hospital building; Maricopa County, Ariz., $756,000, for canal system; Helena, Mont., $826,000, for irrigation.

Steel Not Represented at NIRB Price Control Hearings Last Week

WASHINGTON, Jan. 22.—The absence of representatives of the iron and steel industry at the recent NRA price and price control hearings has caused comment. Virtually all other major industries presented spokesmen through their code authorities, or filed briefs. While no explanation was forthcoming as to the non-appearance of steel representatives, it has been suggested that the answer lies in the steel code itself. The code in its present form has no provisions about which the hearings dealt. It has no "cost recovery," no "sales below cost," no "waiting period" and other such provisions which formed subject matter presented at the four-day session. This would indicate the industry had no reason to make any representations at the proceedings.

The steel code, however, carries geographical wage differentials but it remains to be seen whether the industry will be represented when hearings on that subject come before the board. Employment provisions will be the subject of the next hearing to begin Jan. 30. The industry, however, never has reflected much difference of view on wage differentials, a fact that contrasts sharply with the conflict within the bituminous coal industry over the subject. There being no discord over wage differentials within the steel industry, it is a question as to whether it will be represented at the hearing on this subject. It does afford an opportunity for organized labor to raise a rumpus over employment conditions and it is expected to do so. For this reason representation at the hearing may be considered necessary.

Importance of Hearings Questioned

There is serious doubt if the testimony presented at any of the hearings will have any great bearing on revamping of codes. For the National Industrial Recovery Board has pretty well determined definitely upon the major revisions it will make. Open price filing will be continued, "under proper administration." Which probably means in part that the Government proposes to see that they are open prices in the full sense, available to all who care to know what they are. The waiting period may be continued under certain conditions, though it is no assurance. Actual price fixing, of course, will be lopped off entirely except in "emergency" cases and in the natural resource industries. "Sales below cost" probably will be struck out.

Because of conflicting views among members of NIRB it has announced no policies. Reports have it that the board has been unable to agree upon any policies, aside from those indicated. Plans for the future of NIRB were quite definitely set forth by Chairman S. Clay Williams in an address Thursday night before the annual convention of the National Retail Dry Goods Association in New York. Especial significance was originally but mistakenly given his remarks. They were taken to reflect directly the views of President Roosevelt. Such an interpretation was given to them because on the day preceding Mr. Williams and Blackwell Smith, NRA counsel, were in conference with the President and it is assumed the future of NRA was discussed. Nevertheless at the NIRB it is authoritatively stated that Mr. Williams was not speaking for the board.

Would Continue NRA

After speaking of specific provisions which were declared to have been helpful to industry and labor, and the need of further study in order to find the best method of administering them, Mr. Williams said:

"It is therefore my thought that Congress should, and my hope is that it will, adopt the policy of extending the National Industrial Recovery Act substantially in its present form for an additional period of one or two years. I don't think we are ready to attempt permanent legislation in the field because without more experience and study we could not hope to draft it in form that we could be sure would prove satisfactory. I therefore hope we may keep the act as it is for the further trial period necessary for determining just what should be made permanent and in just what form, for best results."

While Mr. Williams gave credit to NRA and other Government alphabetical agencies for aiding recovery, he explained that any increase in the continuing contribution from those sources will be but a fraction of the original and current contribution. Figuratively giving business and industry the "go" signal in behalf of the New Deal, he pointed out that the final impetus to carry forward to full recovery "is now to be looked for almost wholly out of increased volumes and not out of methods of handling existing volumes." He indicated that such agencies as NRA and AAA have reached their limits to the volume of business that they can create.

He then pointed to the need of confidence, and sharply turned upon radicals, and "camp followers" of the New Deal for setting up "witches and ghosts" that have disturbed business. He did not specify whom he meant in referring caustically to reformers, radicals, and camp followers, but there are such in Congress, of course, and it may be added within the Administration itself. His declaration was taken to serve notice on them that the New Deal does not propose to let them dictate policies that will harm business, industry and labor.

Insisting that under the New Deal program, recovery is well on the way, Mr. Williams said, "that this means that the chances for radical or subversive legislation are very much reduced. One must be doubly radical or have an overdeveloped flair for the experimental to be willing to upset and reverse a course of treatment under which the patient is making such good progress. It would seem, therefore, to be reasonable to assume that as far as business is concerned it will be permitted to follow its course largely along its recent lines without radical change therein."

Meanwhile, reports are current that Mr. Williams, former president of the Reynolds Tobacco Co., may resign soon and that similar action may be taken by other members of the board, including A. D. Whiteside, head of Dun & Bradstreet, New York, and Walter Hale Hamilton. Both Mr. Williams and Mr. Whiteside repeatedly have expressed their desire to return to private life. Mr. Hamilton has been absent from Washington for some time owing to illness. There is the belief, however, that differences of views among board members are a factor looking to a possible reorganized board soon.

The board has made no recommendations to the President. It is known, however, that the NRA legal division has submitted three tentative drafts for legislation to continue NRA, apparently along the general lines indicated by Mr. Williams. These drafts were presented to Donald R. Richberg, director, National Emergency

Council. They are supposed to be under study by him.

The differences within the board only confirm what has been predicted from the outset. It was a rather general opinion when the board was set up by the President that it would never agree on many major policies. This is aside from the conviction that the board is going to make the code revisions suggested, although there is known to be a difference of view over them.

There is certainly a sentiment within the body for a broader range of price fixing than will ever be permitted but it is decidedly in the minority. It is understood too that there is a distinct difference over employment conditions. Sidney Hillman, a member of the board, and one of the shrewdest organized labor leaders in the country, has much support in his views on labor which are inevitably considerably more liberal than those of some of the other members of the board. He has been the largest single factor in the country in placing organized labor representatives on code authorities and this question is becoming more pressing. The policy of NRA in the past has been opposed to labor representation on code authorities. Mr. Hillman has repeatedly insisted that the company union must go.

Congress Critical

The board, of course, has a rough pathway. For not only is it subjected to criticism from industry and the public but likewise it is under the eye of a critical Congress. In that body much is being said backstage, ready to be brought on the House and Senate floors about NRA being responsible for many sins. Much of this talk obviously is sheer bunk, but politically it sounds well. Charges that NRA has tended to aid monopolies are being backed with plans to reinstate the anti-trust laws in full force. Charges that labor has not been given freedom sought for it under Section 7-a, relating to the right of collective bargaining, are being backed by plans for country-wide unionization by legislation. The labor disputes bill likewise again is being poised for reintroduction to kill off all company unions.

Steel Trouble Timed

The gesture to dissolve steel company unions unquestionably was timed with this proposed legislation. This feigned attempt was made by Charlton Ogburn, counsel for the Amalgamated Association of Iron, Steel and Tin Workers, in petitions he filed with the National Steel Labor Relations Board last week. The petitions were directed specifically at so-called company unions at the Duquesne, Pa., and McDonald, Ohio, plants of the Carnegie Steel Co., where the board has ordered elections. As it happens the case has been taken to the courts by counsel for the employee representation groups. Therefore all records have been turned over to the courts and temporarily the case is out of the hands of the board. Moreover, the board has supported and is required by law to support independent company unions just as it must support organized labor unions.

These matters are, of course, tied in directly or indirectly with NRA and add to its muddle. For this reason it is perhaps easy to understand why the steel industry has taken no active part in hearings, thus keeping out of the turmoil as much as possible. But it inevitably will be dragged in on some issues.

Basing Point Case Unsettled

Before the NRA and the Federal Trade Commission there still hangs the unending basing point case. Whether or not there is a difference within NRA on the question—and there has been no surface indication of such a difference—the two Government bodies are hopelessly deadlocked. Efforts are said to have been made to get the NRA and FTC representatives together once more to see if they could present a "joint report" to the White House. But an important NRA representative told THE IRON AGE that it looks as though two reports would have to go to the President and the latter be required to determine his own policy on the much-disputed basing point system. It is certain he is being compelled to do this on many other policies by reason of disagreement within his own official family.

Munitions Inquiry

The steel industry also will come into the limelight in connection with the munitions inquiry. It is well known that Senator Nye, heading the committee making the investigation as to war profit, is preparing to call important steel representatives along with others with a view to quizzing them thoroughly. The stage is being set for political drama. The request for an additional appropriation of $100,000 looked to renewal of the investigation with a long array of witnesses from industry scheduled to be placed on the stand. Agriculture, which itself did quite well in the way of war profits, will not be called to answer for high returns it received, nor will any attention be paid to the fact that excess profits taxes took, as they should have taken, much of the profit out of war from widespread sources.

Hearings on NIRB Employment Policies Scheduled for Jan. 30

WASHINGTON, Jan. 22.—The NIRB has issued formal notice of public hearing on its policy relating to employment provisions in codes. The announcement outlines the scope of the hearing and the board's position on seven major points.

The hearing, which will be held Jan. 30, in the auditorium of the Department of Commerce, will be conducted directly by the members of the board.

Answers to 18 specific questions are expected to develop from the testimony presented. It was pointed out that factual statements of pertinent experiences under codes are expected to give information on the 18 listed as "among the major questions" to be considered in any declaration of policy on employment provisions.

Briefly summarized, the board's present position is as follows:

1. Minimum wage structure—"socially beneficial not only as a safeguard to the worker but as a wage floor for the operation of the competitive system . . . greater simplicity and uniformity could be brought about.

2. Wages above minimum levels—"It is important to determine the effect which inequities in wages above the minimum have upon competitive and other conditions . . ." and to move in the direction of solutions.

3. Wage Differentials—"Geographic and population and other wage differentials being concomitants of our industrial development are to be treated as significant realities . . . factual evidence will be of great service."

4. Maximum hours limitations—"Maximum hours provisions of codes have been a definite contribution to reemployment . . . the principle should be upheld."

5. Changes sought—"Greater simplicity, flexibility and uniformity are possible and desirable."

6. General labor provisions—"Provisions dealing with safety and health, apprenticeship, handicapped persons, stabilization of employment, home-work and the like contribute to the welfare of the worker and to fair competition among in-

dustries so as to justify their continuance in one form or another."

7. Further reemployment—"An increased volume of production is now the most important means of securing reemployment."

Section 7-a will not be considered.

JOB GALVANIZING

Objections or suggestions concerning the proposed amendment to the code for the job galvanizing metal coating division of the fabricated metal products manufacturing and metal finishing and metal coating industry, forbidding sales below individual net price lists must be filed with Deputy Administrator C. R. Niklason, Room 408, 1518 K Street, N.W., before Feb. 5.

WIRE, ROD, AND TUBE DIE

Approval of an amendment to the code for the wire, rod, and tube die industry, allowing overtime in hours of work during peak seasons, has been announced by the NIRB. The amendment will become effective Jan. 26, unless good cause to the contrary is shown. It would permit a 14-hr. week during peak season with time and one-half overtime.

ELECTRIC HOIST AND MONORAIL

Objections or suggestions concerning the proposed amendment to the electric hoist and monorail industry, providing for time and half pay for work on Sundays and holidays must be filed with Deputy Administrator Beverly S. King, Room 3076, Department of Commerce Building, before Feb. 6.

SHOVEL, DRAGLINE AND CRANE

Objections or suggestions concerning the proposed amendment to the shovel, dragline and crane industry code, providing for a clarification of the definition of the industry, must be submitted to Deputy Administrator Neal W. Foster, Room 539, Investment Building, before Feb. 6.

TOOL AND IMPLEMENT MANUFACTURING

An amendment to the code for the tool and implement manufacturing industry relating to the stamping of foreign made goods has been announced.

The amendment is designed to eliminate an unfair competitive practice in the industry by requiring all members when selling or exchanging any product of the industry, a substantial part of which has been made in a foreign country, to clearly label, stamp or brand such products "partly foreign made." It provides further that it is an unfair practice to name or describe such products in any catalog, price list, "flyer," or letter, without stating that it is "partly foreign made."

USED MACHINERY

The National Association of Used Machinery and Equipment Dealers has been notified that the NRA code for the used machinery and equipment distribution trade was signed on Jan. 10. Steps are now being taken to set up a code authority and secure compliance at the earliest possible moment.

OPEN STEEL FLOORING

The supplementary code authority for the open steel flooring (grating) manufacturing industry has submitted for NRA approval a $6,250 budget for the period July 21, 1934, to Jan. 21, 1935, and a proposed basis of contribution by members of the industry of three-fourths of one per cent of net sales for the first 10 months of 1934. Suggestions or objections concerning the proposed budget and basis of contribution must be submitted before Feb. 1, to Acting Deputy Administrator C. R. Niklason, 1518 K Street, N.W.

MACHINE SCREW NUT

The supplementary code authority for the machine screw nut manufacturing industry has proposed the deletion of two trade practice rules and the amendment of another to remove a provision fund to be unworkable. The following definitions of unfair trade practices would be deleted:

"Making contracts of sale that permit the buyer to cancel and/or provide for a reduced price in event of a market decline, but which do not permit the seller to cancel and/or do not provide for an enhanced price, in the event of a market rise.

"Making a contract requiring delivery of a specified quantity or quantities in a specified time, if demanded by the buyer, but not requiring the buyer to accept such quantity or quantities within the specified time."

The rule regulating contracts for unspecified quantities at a specified price, for delivery at the buyer's demand, would be amended by removal of the clause requiring that in such contracts "specifications placed during the last third period thereof shall not exceed the total pieces specified for shipment during the first two thirds thereof." The code authority has found this conditional provision impracticable.

MACHINERY DISTRIBUTERS

A hearing will be held Feb. 4, in Washington, on proposed amendments to the code for the industrial supplies and machinery distributers trade, providing for a method of price filing and procedure for handling trade complaints against unfair pricing practices.

Code Provisions Hamper Capital Goods Group

WASHINGTON, Jan. 22.—Code provisions restricting production of machinery and other capital goods still constitute an important bar to economic recovery and reemployment in the capital goods industries, the Machinery and Allied Products Institute has announced, as the result of a survey just completed. It declared that the theory that these provisions were the best way to bring about prosperity has been exploded and that their fallacy has been proved during the 18 months of their operation. During that period the institute has challenged consistently the effectiveness of such restrictions. It has sought to prevent their inclusion in codes and is continuing the fight to remove those that still exist.

"Prosperity lies not in scarcity created by restricted production, but in productive abundance," the institute pointed out.

It declared that the RFC, recognizing this, recently broadened its policy to provide loans direct to the industry for machinery replacement purchases. The present position of the NIRB "that an increased volume of production is now the most important means of securing employment" was declared to be encouraging.

"The way to better times in the capital goods industries is to end these restrictions," the statement said. "Manufacturers then will be in a position to employ more workers, lighten relief rolls and contribute their full share toward the general progress to normal times."

Steel Workers on Relief Total 76,000

WASHINGTON, Jan. 22. — Steel workers between the ages of 16 and 64 on relief in May, 1934, totaled 76,000, according to Harry L. Hopkins, Federal emergency relief administrator. They included workers at blast furnaces and rolling mills, the total of which in 1930 was estimated at 518,000. The steel workers on relief constituted 2.1 per cent of the total of 3,645,000 of gainful workers estimated to have been on relief last May.

The number on relief in "other iron and steel, etc." plants was 187,000. This classification included many kinds of plants, such as agricultural implement, car and railroad shops, ship and boat building, etc. The figures are estimates by the division of research, statistics and finance of the FERA, based on a "Survey of Occupational Characteristics of Persons Receiving Relief in 79 Cities in May."

The survey was undertaken primarily to obtain an "inventory" of the employment and employability characteristics of the resident urban relief population. Analysis is directed toward ascertaining what proportion of those on relief are able and willing to work, what types of work they are trained to do, etc. The study was made in order to carry out the purposes of the Administration's work relief program.

One-fourth of all workers who usually are employed in the building industry were on relief when the survey was made. Workers in automobile factories and repair shops on relief totaled 80,000.

Steel Industry to Spend $125,000,000 For New Equipment and Modernization

MORE than $125.000,000 has been budgeted by the steel industry for new equipment and plant modernization during 1935, according to an informal poll of steel manufacturers recently completed by the American Iron and Steel Institute. Plans of the steel industry tie in with the nation-wide modernization campaign sponsored by the Government.

New equipment will consist largely of facilities for producing the lighter types of finished steel products. Under the code, there can be no initiation of new construction to increase the present blast furnace, open hearth or Bessemer steel capacity.

Efficient and up-to-date capacity for rolling sheet and strip steel will be materially greater when the new mills under construction or projected are completed. Demand for these products has been steadily increasing in recent years, due largely to increased consumption by the automobile, container and other consumer goods industries.

It is estimated that by Dec. 31, 1935, the finished steel capacity of the industry will be about 3,000,000 tons more than the aggregate capacity on Dec. 31, 1933.

Institute Disagrees With General Dawes

THE American Iron and Steel Institute has taken issue with the recent assertion of Gen. Charles G. Dawes that its estimate of total steel ingot capacity in the country is 15 per cent above present actual capacity. In a statement on the subject the institute says that "the records of each steel plant have been examined by an institute committee composed of operating officials from large steel companies. This committee has carefully excluded from the total, as used by the institute, all capacity that is obsolete and no longer capable of producing steel ingots.

"In addition, in order to be on the conservative side, and to estimate a capacity total at which plants actually could operate if business were available, an arbitrary allowance of 12½ per cent is made for idle time due to repairs and other emergencies which experience shows make it impossible to operate all available furnace at full capacity at all times.

"Accordingly, the institute's figure of total ingot capacity in the country of approximately 67,290,000 gross tons a year really is 12½ per cent lower than it would be if no such allowance were made.

Cleveland Warehouse Chapter Organized

A CLEVELAND chapter of the American Steel Warehouse Association, Inc., was formally organized at a meeting held Jan. 18, at which the following officers were elected: President, Ray D. Love, president, Betz-Pierce Co., Cleveland; vice-president, H. K. Hamilton, president, Hamilton Steel Co., Cleveland; and secretary, Fred S. Doran, manager, Cleveland warehouse, Joseph T. Ryerson & Son, Inc. These officers had served during the temporary organization.

Directors elected were L. M. Derge, Trumbull Mfg. Co., Warren, Ohio; Walter Kurtz, treasurer, Peninsula Steel Co., Cleveland; Heskett Kuhn, Hardware & Supply Co., Akron, Ohio; and K. C. Bartlett, Cleveland manager, Wheelock, Lovejoy & Co., Inc. A constitution and by-laws were adopted and the chapter voted to apply for charter to operate as a unit of the American Steel Warehouse Association, Inc. It also defined by counties the northern Ohio territory over which its activities will extend.

Pittsburgh Steel Co. Elections Ordered

WASHINGTON, Jan. 22.—The National Steel Labor Relations Board has ordered elections at the Monessen and Allenport, Pa., plants of the Pittsburgh Steel Co. The order is similar to previous orders for elections at steel plants. It requires submission of the company's payrolls at the two plants within seven days from the date of the order, Jan. 17, the elections to be held on the seventh and eighth days after that date.

In the event of court action the order calls for submission of the payrolls within five days after the decision is rendered and for elections on the seventh and eighth days thereafter. The board contended that elections held on June 28 and 29 of last year under the employee representation plan were not elections such as are contemplated by the resolution creating the board. Petitions for elections were filed by lodges of the Amalgamated Association of Iron, Steel and Tin Workers.

Used Machinery Dealers Elect

PITTSBURGH, PA., Jan. 22.—At the annual meeting of the National Association of Used Machinery and Equipment Dealers, held here last week, M. D. Galbreath of Pittsburgh was reelected president, S. A. DeWitt of New York, first vice-president; A. M. Kahn of New York, second vice-president; and C. L. McDonald of St. Louis, treasurer.

Twelve directors were elected for the ensuing year, as follows: L. E. Emerman, Chicago; H. M. Capron, Chicago; A. Goldman, Detroit; J. Lee Hackett, Detroit; W. P. Little, Cleveland; J. D. Crawbuck, Pittsburgh; John H. Farrell, Buffalo; Frank L. O'Brien, Philadelphia; J. E. Middleton, Philadelphia; C. A. Simmons, Albany, N. Y.; H. J. Waltmann, New York; Clare Norton, Cincinnati.

Plans were completed for the enlargment of the organization through the formation of additional local chapters, and for the establishment of a clearing house for used machinery inquiries at the association headquarters, 406 Empire Building, Pittsburgh.

U. S. Steel Restores Salary Reduction

THE United States Steel Corpn. has recommended to subsidiary companies, in view of recent improvement in operations and the consequent expansion of activities of the salaried employees in many departments, that, effective Jan. 16, Saturday work shall be resumed by those salaried employees whose services are required full time, and that the salaries of those so resuming shall be restored to the level prevailing prior to Sept. 1, 1934.

The United Iron & Metal Co., Pittsburgh, recently purchased for dismantling two plants of the Mississippi Plate Glass Co., one at Streator, Ill., and the other at St. Louis. The company also recently finished dismantling another plant of the Mississippi Plate Glass Co. at Port Alleghany, Pa.

Fabricated Structural Steel

Awards Higher—New Projects Again Decline

LETTINGS of 12,660 tons compare with 9750 tons last week. Sizable bookings include 2380 tons for Pier 45 in New York City, 2060 tons for a court house at Oakland, Cal., and 1130 tons additional for tunnel supports for the Metropolitan Water District at Los Angeles. New projects of 16,150 tons compare with 19,700 tons in the previous week and 25,950 tons two weeks ago. Among new jobs are 8000 tons for a Wabash railroad bridge over the Missouri River at St. Charles, Mo., and 1500 tons for a building at Mount Vernon, Ohio, for the Pittsburgh Plate Glass Co. Plate awards total more than 1800 tons, with 1200 tons pending. A seawall at Alameda, Cal., for the Coast Guard service station will require 3000 tons of steel piling. Structural steel awards for the week follow:

FABRICATED STRUCTURAL STEEL AWARDS

NORTH ATLANTIC STATES

Providence, R. I., 130 tons, addition to State office building, to Bethlehem Fabricators, Inc.

Howard, R. I., 195 tons, dormitory, to Bethlehem Fabricators, Inc.

South Glens Falls, N. Y., 120 tons, high school, to Smith & Caffrey Co.

Long Island City, N. Y., 225 tons, bakery building, to National Bridge Works.

New York, 2380 tons, Pier 45, to McClintic-Marshall Corpn.

New York, 800 tons, class room for Fordham University, to Bethlehem Fabricators, Inc.

Elmira, N. Y., 310 tons, power house for reformatory, to American Bridge Co.

Philadelphia, 150 tons, warehouse for J. H. Kenny, to Belmont Iron Works.

Tioga County, Pa., 100 tons, bridge, to American Bridge Co.

Chester County, Pa., 160 tons, highway bridge, to McClintic-Marshall Corpn.

SOUTH AND SOUTHWEST

Tillman and Caddo Counties, Okla., 535 tons, highway bridges, to Capital Steel & Iron Co.

Augusta, Ga., 230 tons, highway bridge, to Southern Engineering Co.

Idabel, Okla., 800 tons, bridge, to Muskogee, Iron Works.

CENTRAL STATES

Gallipolis, Ohio, 1000 tons, permanent and temporary steel piling for Gallipolis Dam, to Jones & Laughlin Steel Corpn.; Dravo Contracting Co., general contractor.

Portsmouth, Ohio, 130 tons, post office, to Portsmouth Structural Steel Co.

Durand, Mich., 195 tons, highway bridge, to R. C. Mahon Co.

Detroit, 105 tons, Eton Mfg. Co. building extension, to R. C. Mahon Co.

Havana, Ill., 500 tons, bridge, to McClintic-Marshall Corpn.

Joliet, Ill., 800 tons, bridge, for Santa Fe Railroad, to American Bridge Co.

Cedar Rapids, Iowa, 100 tons, grain elevator, to Gage Structural Steel Co.

Bloomington, Ill., 100 tons, school, to Mississippi Valley Structural Steel Co.

St. Louis, 550 tons, Page Avenue viaduct, to Mississippi Valley Structural Steel Co.

WESTERN STATES

Springville, Utah, 110 tons, State highway bridge, to American Bridge Co.

Oakland, Cal., 2060 tons, Alemeda County court house, to McClintic-Marshall Corpn.

Centerville, Cal., 125 tons, Kings River bridge, to Minneapolis-Moline Power Implement Co.

Los Angeles, 400 tons, school, to Minneapolis-Moline Power Implement Co.

Los Angeles, 1130 tons additional, tunnel supports for Metropolitan Water District, to Commercial Shearing & Stamping Co.

Kern County, Cal., 100 tons, State undercrossing, to an unnamed bidder.

Clallam County, Wash., 100 tons, State bridge over Sol Duc River, to Steel Fabricators, Inc.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Beacon Falls, Conn., 280 tons, State highway bridge.

New York, 260 tons, Green Point hospital building.

North Philadelphia, Pa., 500 tons, post office; bids to be taken at Washington, Feb. 1.

State of New Jersey, 600 tons, five bridges; general contract bids due soon.

SOUTH AND SOUTHWEST

Big Stone Gap, Va., 175 tons, State highway bridge.

Greenville, N. C., 250 tons, industrial building.

Ayden, N. C., 200 tons, industrial building.

Morgan City, La., 375 tons, bridge.

Phoenix, Ariz., 1250 tons, post office; previously reported as 500 tons.

CENTRAL STATES

Mount Vernon, Ohio, 1500 tons, mill building for Pittsburgh Plate Glass Co.

Gambrinus, Ohio, 600 tons, addition to building for Timken Roller Bearing Co.

Lamont, Ill., 550 tons, bridge.

St. Charles, Mo., 8000 tons, approximately, completion of bridge across Missouri River for Wabash Railway, for which PWA loan of $2,350,000 has been approved. Indefinite as to when bids will be asked.

Fort Scott, Kan., 100 tons, post office.

WESTERN STATES

Akron, Colo., 150 tons, State highway bridge.

Boulder City, Nev., 600 tons, control cable supports.

Sheridan County, Wyo., 148 tons, State overhead crossing; bids Jan. 24.

Flathead County, Mont., 700 tons, two State bridges; bids Jan. 25.

Seattle, 233 tons, galvanized steel angles for city; bids under advisement.

Josephine and Multnomah Counties, Ore., 233 tons, State bridges over Applegate River and Columbia Slough; bids Jan. 31.

Alameda, Cal., 3000 tons, steel piling, sea wall for Coast Guard service station; M. B. McGowan, San Francisco, low bidder for general contract.

FABRICATED PLATE

AWARDS

New York, 1380 tons, caissons for Federal office building, to Petroleum Iron Works.

Cambridge, Md., 200 tons, elevated tank, to Pittsburgh-Des Moines Steel Co.

Shelbyville, Ky., 140 tons, elevated tank, to Chicago Bridge & Iron Works.

New Orleans, 110 tons, boiler barges, to Pennsylvania Shipyards, Inc.

Los Angeles, Metropolitan Water District, Specification 31,615, 25,000 ft. of 30-in. 10-gage welded pipe, to Western Pipe & Steel Co.

NEW PROJECTS

La Crosse, Wis., 350 tons, tanks.

Wausau, Wis., 850 tons, tanks.

Cast Iron Pipe

Westfield, Mass., has awarded 100 tons to Warren Foundry & Pipe Corpn.

Uniontown, Ky., closes bids about Jan. 30 for water pipe lines; also for steel reservoir, pumping station and filter plant. Fund of $76,000 has been arranged. Former bids, closing Dec. 19, have been rejected. H. K. Bell, Lexington, Ky., is consulting engineer.

Secretary, Md., asks bids until Feb. 1 for 8080 ft. of ¾, 2, 6 and 8-in. for water supply and service connections; also for 50,000-gal. elevated steel tank. Leon Bradshaw, East New Market, Md., is water commissioner in charge. J. R. Cronister, Cambridge, Md., is consulting engineer.

Palmyra, N. Y., will soon ask bids for main water trunk line from Canandaigua Lake to water storage plant. Cost over $250,000. W. S. Lozier, Inc., 10 Gibbs Street, Rochester, N. Y., is consulting engineer.

Whiting, Iowa, plans water pipe line system. Bond issue of $20,000 has been authorized. Buell & Winter, Insurance Exchange Building, Sioux City, Iowa, are consulting engineers.

Tillar, Ark., will soon take bids for water pipe line system. R. E. Williams, Southern Building, Little Rock, Ark., is consulting engineer.

Spencer, S. D., will soon take bids for about 12,000 ft. of various sizes for water distribution system; also for 50,000-gal. elevated steel tank. Fund of $32,000 has been arranged. Albert Chenoweth, Paulton Building, Sioux Falls, S. D., is consulting engineer.

Miami, Fla., closes bids Jan. 25 for completion of 30-in. main trunk line from water station at Hialeah to connection with similar size main in city, about 28,325 ft., including 10 30-in. gate valves, air valves and other equipment.

Stryker, Ohio, plans water pipe lines. Fund of $58,000 has been secured through Federal aid. J. D. Ramsey, mayor, is in charge.

Elizabethtown, Ill., asks bids until Feb. 7 for pipe line system and other waterworks construction. Fund of $38,000 has been secured through Federal aid. Kinzie Engineering Co., Pekin, Ill., is consulting engineer.

Sabetha, Kan., plans about 6½ miles of 8-in. for main water supply from Deer Creek, where dam will be built; also new filtration plant and other waterworks equipment. Bond issue of $100,000 has been authorized to apply on total estimated cost of $165,000. Wilson Engineering Co., Farmers' Union Building, Salina, Kan., is consulting engineer.

Murfreesboro, Ark., plans water pipe line system. Cost about $40,000 with elevated tank and tower and other waterworks equipment. F. A. Prichett, Wallace Building, Little Rock, Ark., is consulting engineer.

Gunnison, Utah, has awarded 230 tons to an unnamed bidder.

Los Angeles will take bids Jan. 25 on 637 tons of 6-in.

Redwood City, Cal., plans water system improvements calling for 355 tons of 10 and 12-in.

Redmond, Ore., has taken bids on 203 tons of 12-in., with alternates on steel.

Veradale, Wash., will take bids Feb. 1 on 526 tons of 4 to 8-in. with alternates on steel and wood.

Puncturing the American "Munition Trust" Bogey

(CONCLUDED FROM PAGE 13)

will be the contribution of industry to our national defense, and no corrosion or threat on the part of Congressional committees will ever be necessary to induce American industry to do its bit.

As a matter of public policy it may be advisable to place a limit on the profit to be allowed on so-called war contracts. If so, let us be honest and base the profit on what is actually cost, and not on any such fictitious figures as those condemned in the Shannon report.

Those in charge of the Army and Navy Departments during the war can testify to the cooperation these departments had from American industry, cooperation so perfect that had the war gone into another campaign the production of munitions from American plants would have amazed the world. Those interested in the future of Germany knew this, they knew definitely what we were doing, and it is significant that an armistice was requested just as the full force of our productive capacity was being realized.

Courts all the world over give considerable credence to the rule of reason. The adoption of this rule by the Nye Committee might not be amiss.

Engineering Aspect of High-Strength Steels

(CONCLUDED FROM PAGE 30)

(b) Does the chemical composition conform to that on which corrosion predictions have been made?
(c) Do shop welds exhibit sufficient strength to permit their use in design?
(d) Are shop welds sufficiently dense (free from porosity) to permit comparison with weld corrosion predictions?
(e) Are the physical properties objectionally affected by anticipated methods of fabrication — cold work — hot work — punching or welding?

3.—By the Buyer's Shop:
(a) Is the finish available suitable for the part?
(b) Is the flatness available suitable for the part?
(c) Can the material be processed with existing equipment or will new, stronger equipment be required in addition to that required by redesign?
(d) Can the new material be welded with available facilities to produce a smooth workmanlike weld?

4.—By the Producer:
(a) What is the corrosion resistance of the metal as furnished?
(b) Will the corrosion resistance of the structure be changed by anticipated methods of fabrication, service or repair?

5.—By the Buyer:
(a) Is the new material available at a satisfactory price and within reasonable delivery periods?
(b) Are the necessary complements for construction — bolts, rivets, welding rods, etc.—available at reasonable price and within reasonable delivery periods?
(c) Will the advantages accrued by the change in design, through saving in net costs, saving in service costs, saving in weight and advertising value, offset the cost of redesign, cost of development and production and hazard of service?

Railroad Equipment

Baltimore & Ohio is inquiring for 50 to 150 hopper cars for transporting cement.

Chilean State Railways are inquiring for 15 passenger coaches and six sleeping cars.

Northern Pacific has ordered six de luxe light-weight coaches from Pullman Car & Mfg. Co.

New York Central, 466 Lexington Avenue, New York, W. C. Bower, vice-president, in charge of purchases and stores, asks bids until Jan. 29 for air-conditioning equipment for passenger cars (Serial Contract 1-1935).

RAILS

Chicago, Burlington & Quincy will enter market soon for about 15,000 tons of rails and 4000 tons of track accessories.

Norfolk & Western has placed orders for 24,000 tons of rails with Carnegie Steel Co., 8000 tons with Bethlehem Steel Co.; and has distributed 10,000 to 12,000 tons of track fastenings with Jones & Laughlin Steel Corpn., Weirton Steel Co., Wheeling Steel Corpn., Republic Steel Corpn., and others.

New York Central will purchase 20,000 tons of rails and 9000 tons of track fastenings through a PWA loan of $1,206,000, which Administrator Harold L. Ickes has announced. This loan is in addition to another of $2,500,000 made last spring for the purchase and laying of 37,000 tons of rails, all of which have been laid. The PWA also has allotted an additional $80,000 to the Great Northern railroad to supplement a former loan of $5,785,000 made last winter for a general roadway improvement and equipment program. The increase was made in order to cover an underestimate of the cost of the program.

Pipe Lines

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 4, for 30,000 ft. of galvanized steel pipe; also for 2000 ft. cast iron pipe (Schedule 3025).

Ramapo Gas Co., Ramapo, N. Y., plans steel pipe line for gas distribution at Tappan, N. Y. Cost over $35,000.

General American Transportation System, Inc., 230 South Clark Street, Chicago, plans crude oil steel pipe line from east Texas oil field district to new bulk oil storage and distributing plant on Houston ship channel, Houston, Tex. Entire project will cost over $500,000. Company is affiliated with General American Tank Car Corpn., first noted address.

Stanoline Oil & Gas Co., Tulsa, Okla., has let contract to Apex Construction Co., Exchange Bank Building, Tulsa, for new steel pipe line from oil properties near Alvin, Tex., to connection with main steel trunk line to Texas City, Tex.

Wisconsin Rapids Gas Co., Wisconsin Rapids, Wis., plans steel pipe lines at Port Edwards, Wis., for commercial gas distribution, with main steel trunk line to village limits for supply. Work will begin in spring.

Linton, Ind., plans natural gas steel pipe line system. Cost about $80,000. Project will be carried out through Federal aid and will soon begin. H. F. Osler, Linton, is engineer in charge.

Lavaca Gas Co., Port Lavaca, Tex., recently organized by Frank M. Dudgeon, Port Lavaca, and associates, plans steel pipe system for local gas distribution. Company is arranging for long-term gas franchise with municipality.

Tacoma, Wash., will take bids Jan. 31 on about 5318 tons for Green River pipe line replacement; alternates on iron or concrete.

Redmon, Ore., takes bids Jan. 24 on 525 tons of steel pipe, 18,800 ft. of 10 to 14-in.; alternates on cast iron and wood.

Veradale, Wash., will take bids Feb. 1 on 346 tons of steel pipe, 47,000 ft. of 3½ to 8-in.; alternates on cast iron and wood.

Large Concrete Bar Award on Coast

SAN FRANCISCO, Jan. 21.—The Metropolitan Water District of Southern California, Los Angeles, has awarded 5830 tons of reinforcing bars and 25,000 ft. of steel pipe. Of the bars, which were bought under specification M-2037, awards of 2075 tons each of rail reinforcing were made to the Truscon Steel Co. and the Security Materials Co., and 1680 tons of billet bars went to the Soule Steel Co. Under specification No. 31615 an award of 25,000 ft. of 30-in., 10-gage, welded pipe was made to the Western Pipe & Steel Co.

Bookings of 432 tons of reinforcing bars by Soule Steel Co. for a factory at Oakland, Cal., and 430 tons of structural steel by Isaacson Iron Works for work at Grand Coulee dam were among other lettings of note.

Tacoma, Wash., will proceed with a nine-mile replacement of the Green River gravity pipe line. Bids are being taken Jan. 31 on the furnishing of iron, concrete or steel pipe. Approximately 5318 tons of steel plates will be required if the latter alternate is accepted. The date for bids for enlarging and lining the Moffatt tunnel, west of Denver, Colo., was advanced to Jan. 23. Estimated requirements for the project are 3500 tons of reinforcing bars.

Steel Production in Further Rise to 51½ Per Cent of Capacity

Pressing Requirements of Motor Car Makers and Growing Demands From Miscellaneous Sources Lift Mill Operations—Scrap Loses Buoyancy

WITH automobile production rapidly approaching 1930 levels and with miscellaneous demands for iron and steel multiplying, ingot output has been given another boost. Rising to 51½ per cent from 49 per cent last week, raw steel production has attained a rate that was not reached a year ago until the middle of April.

Further gains in operations are apparently assured, though a setback in scrap has introduced a note of caution. Following the declines at Chicago last week, scrap prices in most market centers have lost much of their buoyancy, and THE IRON AGE composite for heavy melting steel remains unchanged at $12.33 for the third consecutive week. The current hesitancy of old material prices, though possibly attributable in part to uncertainty as to the outcome of the gold clause case, is generally regarded as a temporary reaction from excessive bullishness on the part of the scrap trade. It is too early, it is believed, for scrap to portend a leveling off of steel production.

CERTAINLY there are no evidences of a relaxation in the demand for steel from the automotive industry. Mill deliveries on cold-finished sheets, used for motor car bodies, have extended to five or six weeks. Leading automobile makers are virtually sold out until April 1, passenger car sales this month being double those of last January. Production in the first quarter is now estimated at more than one million cars as compared with 749,532 in the same quarter last year and 1,046,689 in 1930, the last year in which output in the first three months passed the million mark.

Heavy rejections of wide cold-rolled sheets by the automobile industry are causing widespread complaints among mills, and there is talk of advancing the price of this product for the second quarter.

With some full-finishing units running at capacity, sheet mill operations are now averaging 60 per cent of capacity. Strip mills are operating at a similar rate, while tin plate output is holding at 60 to 65 per cent.

THE growing diversification of steel demand, which is particularly marked in the Chicago district, is ascribed not only to increased production of miscellaneous finished products but to a resumption of delayed plant maintenance work. The appearance of numerous small building projects also indicates a more confident attitude on the part of private enterprise, at any rate so far as moderate expenditures are concerned. Public utility companies, however, are covering their requirements with extreme caution.

Railroad buying likewise remains conservative, although certain lines are becoming apprehensive lest a further rise in carloadings will find them with a shortage of serviceable equipment. At least one large road is seriously considering undertaking a large freight car repair program or purchasing new equipment. The Baltimore & Ohio is now in the market for 50 to 150 hopper cars. Another Eastern road has bought five light-weight, high-tensile steel hopper cars. The Chilean State Railways are asking for figures on 21 passenger cars.

The Louisville & Nashville has awarded 15,000 tons of rails to the Alabama mill. The New York Central has secured a PWA loan to finance the purchase of 20,000 tons of rails and 9000 tons of track fastenings. The Norfolk & Western has distributed orders for 24,000 tons of rails and 12,000 tons of track accessories.

STRUCTURAL steel awards of 12,660 tons compare with 9750 tons last week. New projects total 16,650 tons as against 19,700 tons in the previous week. Plate awards call for 1800 tons. A seawall at Alameda, Cal., for the Coast Guard service station will require 3000 tons of sheet steel piling. The metropolitan water district, Los Angeles, has awarded 5830 tons of reinforcing bars and 1130 tons of structural steel.

Leaders of the American Federation of Labor will convene in Washington next week to discuss the feasibility of united action against the automobile, steel and textile industries. Meanwhile, notwithstanding the poor showing it made in employee elections at various automobile plants, the federation will hold a series of mass meetings in southern Michigan to be climaxed by a meeting in Detroit on Feb. 23 which will be broadcast over a nation-wide hook-up.

STEEL output is up four points to 36 per cent at Pittsburgh, two points to 59 per cent at Chicago, six points to 35 per cent in the Philadelphia district, three points to 63 per cent in the Valleys and five points to 95 per cent in the Wheeling area. Operations are off two points to 67 per cent at Cleveland and four points to 25 per cent in the South.

THE IRON AGE composite prices for pig iron and finished steel are unchanged at $17.90 a ton and 2.124c. a lb. respectively.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Jan. 22, 1935	Jan. 15, 1935	Dec. 24, 1934	Jan. 23, 1934
Per Gross Ton:				
No. 2 fdy., Philadelphia	$20.26	$20.26	$20.26	$19.26
No. 2, Valley furnace	18.50	18.50	18.50	17.50
No. 2 Southern, Cin'ti	19.13	19.13	19.13	18.13
No. 2, Birmingham†	14.50	14.50	14.50	13.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	17.50
Basic, del'd eastern Pa.	19.76	19.76	19.76	18.76
Basic, Valley furnace	18.00	18.00	18.00	17.00
Valley Bessemer, del'd P'gh	20.76	20.76	20.76	19.76
Malleable, Chicago*	18.50	18.50	18.50	17.50
Malleable, Valley	18.50	18.50	18.50	17.50
L. S. charcoal, Chicago	24.04	24.04	24.04	23.54
Ferromanganese, seab'd carlots	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	32.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	26.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	26.00
Slabs, Pittsburgh	27.00	27.00	27.00	26.00
Forging billets, Pittsburgh	32.00	32.00	32.00	31.00
Wire rods, Pittsburgh	38.00	38.00	38.00	36.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.60

Finished Steel

Per Lb.	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.75
Bars, Chicago	1.85	1.85	1.85	1.80
Bars, Cleveland	1.85	1.85	1.85	1.80
Bars, New York	2.13	2.13	2.13	2.08
Plates, Pittsburgh	1.80	1.80	1.80	1.70
Plates, Chicago	1.85	1.85	1.85	1.75
Plates, New York	2.08	2.08	2.08	1.98
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.70
Structural shapes, Chicago	1.85	1.85	1.85	1.75
Structural shapes, New York	2.05¼	2.05¼	2.05¼	1.95¼
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.75
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.40

Finished Steel

Per Lb.	Jan. 22, 1935 Cents	Jan. 15, 1935 Cents	Dec. 24, 1934 Cents	Jan. 23, 1934 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.25
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.35
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	2.85
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	2.95
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.75
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.85
Wire nails, Pittsburgh	2.60	2.60	2.60	2.35
Wire nails, Chicago dist. mill	2.65	2.65	2.65	2.40
Plain wire, Pittsburgh	2.30	2.30	2.30	2.20
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.25
Barbed wire, galv., P'gh	3.00	3.00	3.00	2.85
Barbed wire, galv., Chicago dist. mill	3.05	3.05	3.05	2.90
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.25

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$13.50	$13.50	$13.25	$13.50
Heavy melting steel, Phila.	11.75	11.75	10.75	11.75
Heavy melting steel, Ch'go	11.75	11.75	10.75	10.75
Carwheels, Chicago	12.00	12.00	11.50	11.00
Carwheels, Philadelphia	10.75	10.75	10.75	12.75
No. 1 cast, Pittsburgh	**13.25**	12.75	12.75	11.75
No. 1 cast, Philadelphia	11.00	11.00	11.00	12.50
No. 1 cast, Ch'go (net ton)	11.00	11.00	10.00	9.50
No. 1 RR. wrot., Phila.	11.25	11.25	11.25	11.00
No. 1 RR. wrot., Ch'go (net)	*10.50*	11.00	9.75	9.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.85	$3.85	$3.85	$3.50
Foundry coke, prompt	4.60	4.60	4.60	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery‡	8.75	8.75	8.75	8.12½
Lake copper, New York‡	9.12½	9.12½	9.12½	8.37½
Tin (Straits), New York	**51.15**	50.55	50.90	51.62½
Zinc, East St. Louis	3.75	3.75	3.72½	4.25
Zinc, New York	4.10	4.10	4.07½	4.60
Lead, St. Louis	3.55	3.55	3.55	3.90
Lead, New York	3.70	3.70	3.70	4.00
Antimony (Asiatic), N. Y.	14.50	14.50	13.75	7.20

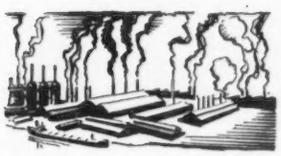
On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. ‡Blue Eagle copper.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
Jan. 22, 1935	2.124c. a Lb.	$17.90 a Gross Ton	$12.33 a Gross Ton
One week ago	2.124c.	17.90	12.33
One month ago	2.124c.	17.90	11.58
One year ago	2.008c.	16.90	12.00
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1934	2.199c., April 24;	2.008c., Jan. 2	$17.90, May 1;	$16.90, Jan. 27	$13.00, Mar. 13;	$9.50, Sept. 25
1933	2.015c., Oct. 3;	1.867c., April 18	16.90, Dec. 5;	13.56, Jan. 3	12.25, Aug. 8;	6.75, Jan. 5
1932	1.977c., Oct. 4;	1.926c., Feb. 2	14.81, Jan. 5;	13.56, Dec. 6	8.50, Jan. 12;	6.42, July 29
1931	2.037c., Jan. 13;	1.945c., Dec. 29	15.90, Jan. 6;	14.79, Dec. 15	11.33, Jan. 6;	8.50, Dec. 29
1930	2.273c., Jan. 7;	2.018c., Dec. 9	18.21, Jan. 7;	15.90, Dec. 16	15.00, Feb. 18;	11.25, Dec. 9
1929	2.317c., April 2;	2.273c., Oct. 29	18.71, May 14;	18.21, Dec. 17	17.58, Jan. 29;	14.08, Dec. 3
1928	2.286c., Dec. 11;	2.217c., July 17	18.59, Nov. 27;	17.04, July 24	16.50, Dec. 31;	13.08, July 2
1927	2.402c., Jan. 4;	2.212c., Nov. 1	19.71, Jan. 4;	17.54, Nov. 1	15.25, Jan. 11;	13.08, Nov. 22

Pittsburgh District Rate In Four-Point Advance



Now Averages 36 Per Cent—Valley Operations Rise to 63 Per Cent and Wheeling District Average Reaches 95 Per Cent

PITTSBURGH, Jan. 22.—Raw steel production in the Pittsburgh district this week is scheduled at approximately 36 per cent of capacity, representing a four-point advance for the week and the fifth consecutive weekly rise since the Christmas week, when output was only 24 per cent. The current rate thus represents also an approximate 50 per cent increase in output during the past month. Gains also are recorded in the Wheeling district, which is five points higher at 95 per cent, and in the Valleys and nearby northern Ohio mills, which are three points higher at 63 per cent. In all three districts blast furnaces have been lighted to meet increased open-hearth and Bessemer schedules.

In the Pittsburgh area this week's gains are based on a generally heavier flow of miscellaneous steel orders, while in the other two producing districts the bulwark of current demand is flat rolled steel for new motor car construction. Some small independent mills in the Pittsburgh district are maintaining heavy rolling schedules chiefly on automotive tonnage, but the two leading producers are benefiting more largely from a better movement to non-integrated mills of semi-finished steel, notably sheet bars for tin plate conversion.

Tin plate production for the country this week continues at 60 to 65 per cent, which is fairly representative of activity in this district and is accounting in no small measure for the improvement here. Strip mills and sheet mills are maintaining production at around 60 per cent of capacity, with full finishing units in the lead.

The local rail mill this week will probably roll against an accumulation of small rail orders and next week likely will start production on the 24,000-ton rail order from the Norfolk & Western. Quiet interest in new light-weight rolling stock is spreading among the carriers.

Pig Iron

A merchant furnace at Sharpsville, Pa., was lighted on Jan. 19, after having been inactive for more than six months. It is difficult to discern more than a meager improvement from week to week in pig iron business in this district. Merchant trade is still rather depressed. Non-integrated users of basic and Bessemer, though operating on sharply increased schedules, have not openly increased their takings of pig iron. There is still a large spread between cast scrap quotations and pig iron prices, and until this gap is narrowed mills will favor economies through larger scrap charges.

Semi-Finished Steel

Further increases in the movement of sheet bars are stimulated by brisk activity among detached sheet mills and tin plate units. Billets, blooms and slabs likewise are gaining ground. Skelp is moving satisfactorily. Wire rods are a shade more active.

Bolts, Nuts and Rivets

Heavy stocks accumulated in fourth quarter at old prices have not been reduced sufficiently to warrant replenishment. General requirements of the railroads are in moderate volume, while demands from the automotive industry are considered satisfactory. Although prices are well held in Eastern markets, unsettlement is reported at Chicago. Important producers, however, are attempting to maintain present schedules in all sections, despite the absence of further developments in the bolt and nut industry's plans for codification.

Rails and Track Accessories

The Norfolk & Western has ordered 24,000 tons of steel rails from the Carnegie Steel Co., and 8000 tons from the Bethlehem Steel Co. The Carnegie Steel Co.'s. share is for delivery during the next 60 to 90 days, and will provide 35 to 40 per cent operations for about six weeks at its local rail mill, which has been intermittently engaged in recent months in the production of sheet bars. About 12,000 tons of spikes, bolts, tie plates, joints, and rail anchors has been distributed among at least four producers in the Tri-State district.

Reinforcing Steel

Proposed Federal postoffice construction and plans for extensive State road work in the spring are the main features in this market at present. Current incoming tonnage is not benefiting mill schedules measurably. A fair share of work already figured portends early placement of some round lots, including reinforcement for the Gallipolis River dam at Gallipolis, Ohio, for which Dravo Contracting Co. holds the general contract.

Bars

The heavy demand from automotive consumers has not abated, and the tendency in general specifications still is upward. Notable support continues from farm implement makers, whose production program is making definite headway. Alloy bars are sharing proportionately in the current activity.

Cold-Finished Steel Bars

The chief source for further improvement in specifications is the automotive industry. Other consuming lines are contributing on a lesser scale, while the jobbing trade is not yet disposed to specify freely.

Plates and Shapes

The plate market is not sharing in the improvement in general steel markets. The lack of business for plates is readily understandable, however, in that railroads are not active in construction work, nor are shipyards or barge yards busy at this season. Tank construction also seems to be an absent prospect. A few barge projects are being figured, but by no means are assured of reaching the contracting stage. The structural steel market continues under the influence of restricted activity both in public and private fields. The past week added little to fabricating schedules in this district. Notable among the week's awards was 2380 tons for pier No. 45 at New York to McClintic-Marshall Corpn. New construction work included two private projects, one at Mount Vernon, Ohio, calling for 1500 tons for a mill building for the Pittsburgh Plate Glass Co., and the other at Gambrinus, Ohio, for 600 tons for an addition to the Timken Roller Bearing Co. building. State highway bridge construction continues to predominate among new specifications.

Wire Products

Manufacturers' wire still is the hub of activity in this market. Specifications for this class of wire

are naturally sponsored by automotive demand. The leading motor car maker is figuring prominently in the current market. Wheel makers are active takers of spoke wire. Specifications for wire nails, barbed wire and other merchant items are restricted. Wire mills are engaged at an estimated average of 35 per cent of capacity.

Tubular Products

Demand continues to be steady. Specifications for mechanical tubing from automotive centers are perhaps leading in current interest, but from a tonnage standpoint demand for oil country goods holds the spotlight. Although no noticeable pickup has yet occurred in the movement of drill pipe, casing and tubing to the oil fields, pipe producers are considerably encouraged by the strong tone of crude prices in the face of recent developments in the oil industry. The prospects for an expanding market for oil country goods still are considered favorable. A slight increase in demand for wrought iron pipe has been noticeable since the beginning of the year.

Sheets

Specifications from motor car makers are in sustained volume and are estimated to represent about 60 per cent of current sheet shipments. Farm implement manufacturers are specifying regularly, while miscellaneous sheet business is holding.

Tin Plate

Specifications still are in sufficient volume to maintain operations of 60 to 65 per cent for the tin plate industry. An independent mill in this district this week is scheduled at capacity, while larger producers will be engaged at around 62 per cent. Based on present indications, no serious interruption to the present rate of operations is in sight.

Strip Steel

The bulk of current specifications continues to be for automobile consumption. No slump in the requirements of other important consuming groups is in prospect. For the past 60 days barrel makers have been in an off season, and demand for cooperage stock has consequently been limited. However, specifications for cooperage stock face early expansion.

Coke and Coal

Activity in this market continues to fluctuate with changeable weather. A recent warm spell has again restricted demand for domestic and heating grades. The movement of foundry coke shows little improvement, and prospects for expanding requirements from the foundries in the Pittsburgh district are not considered bright.

Scrap

Despite an easiness in dealer offering prices the scrap market retains its recent firm undertone. The major steel-making grades are holding, with $13 to $14 representative for No. 1 heavy melting steel delivered in the Pittsburgh district. On recent sales machine shop turnings and short shoveling turnings are 50c. a ton higher, at $9 to $9.50. Approximately 10,000 tons of No. 1 cast was sold in the past 10 days to a mill in this district at about $12.75, delivered, an advance of at least 75c. a ton over the previous quotation. No. 1 cast also is firmer. Although the important consumers of railroad specialties are not in the market, this group is commanding substantial prices for small-lot shipments. Compressed sheet steel is plentiful at the present range of $12.75 to $13.25. A leading pipe company at Pittsburgh recently purchased approximately 25,000 tons of steel scrap for its Lorain, Ohio, plant. The tonnage was comprised of about 15,000 tons of No. 1 steel and 10,000 tons of compressed sheets reported at approximately $13.25 and $12.75, delivered, respectively. A large share of the scrap will be Lake material.

Swelling Bookings Push Valley Steel Production to Higher Levels

YOUNGSTOWN, Jan. 22.—Substantial steel orders from automotive centers, flanked by steady daily bookings from miscellaneous sources, have driven steel output in the Valleys almost to the 1934 peak of 66 per cent, reached in the second week last June. Operating plans for the current week here assure a raw steel production of at least 62 per cent, with good prospects for a higher rate late in the week. Bessemer capacity at a leading independent mill was added on Sunday night, making a total of four Bessemer plants now active.

No immediate let-up in Bessemer or open-hearth activity is in sight. Blooming mills and other semi-finishing units are unusually pressed to meet the insistent demands of finishing mills, which in at least one case are operating at virtual capacity. Full-finished sheet mills are setting the pace, this group benefiting chiefly by the heavy automotive demand for autobody sheets and other automobile stock. For the first time in at least six months and a half, one producer is being forced to decline sheet orders specifying immediate shipment. Other makers, while not so fortunate, are able to maintain a steady backlog as a result of the most satisfactory inflow of steel orders since last June.

Unquestionably, automotive specifications represent the main root for the present sprouting of activity in the Valleys. The miscellaneous offshoots of business from other quarters are doing their part, however, to maintain, or accelerate, current rolling schedules. Some miscellaneous business is defying seasonal trends.

Public utility companies, which usually enter the market for pipe at this season, are covering their requirements with extreme caution at present. Their timidity is obviously the result of Federal pressure, which, until relaxed, will restrict pipe requirements. Valley pipe producers, however, do not believe that a substantial utility demand exists, despite the Federal attitude, since large gas and water lines are not generally carrying peak loads. Pipe for service lines constitutes the bulk of present needs.

The volume of pig iron orders is greater than it was during the first half of December. Valley producers report a heavier interest in high-silicon, high-manganese pig iron, which permits a greater scrap load. Cast iron scrap, it is pointed out, has not followed the rapid rise in steel scrap, and foundries have not reduced materially the proportion of scrap in cupola charges. Greater scrap loads have made foundries more stringent about pig iron analyses.

With practically all important users of steel-making scrap temporarily out of the market, heavy melting steel scrap is not firm. No. 1 steel is readily procurable at $13.50, the last price paid for an important tonnage. Some yard stocks are reported to be heavier than they were a month ago, and scrap offerings are being made with considerably more freedom. The two leading independent steel mills in this district covered on a total of approximately 50,000 tons of scrap early it January, the first price having been $13 and the second figure $13.50, delivered. No. 2 steel is obtainable at around $12.75.

Chicago Output Up Two Points to 59 Per Cent

Growth of Miscellaneous Demand Is Especially Encouraging—Scrap Erratic —Pig Iron Shipments in Sharp Gain Over December

CHICAGO, Jan. 22.—The true solidity of the steel market as it now stands is exemplified by the increasing momentum of buying and specifying by miscellaneous consumers. The fact of the matter is that, although the two major consumers that have been giving the best market support are still increasing their needs, it is the rapid acceleration of demand from scattered small shops that is now holding the spotlight. With the growing diversification of business the district ingot rate has risen two points to 59 per cent of capacity, and both new buying and current specifications point to further betterment.

Some scattered railroad business has come into the market, and plates, long one of the most dormant of steel mill products, are in slightly better demand. Improvement is also noted in building, in which field the expenditure of Government money is still the major supporting influence. However, it is worthy of note that small projects, taking 10 to 75 tons each, are increasing in number, with many of the jobs of a private character.

Fencing and nails are moving in better volume, and wire mills, now operating close to 45 per cent of capacity, will soon expand output in order to build and round stocks that must be in readiness for spring demand.

The scrap market is bobbing first one way and then the other, with factors as to strength and weakness about evenly divided.

Pig Iron

Shipments during the first three weeks of the month top the corresponding period of December by not less than 65 per cent. New buying, both contract and spot, remains active. Most leading consumers are increasing specifications and several stove plants that have been down for several weeks are resuming operations.

Reinforcing Bars

Severe weather has slowed up building operations. Contractors have started to buy bars for Illinois bridge work, but tonnages for road slabs are being allowed to rest for the time being. Bar fabricators are inclined to the belief that the Outer Drive bridge, a Chicago project, will go ahead. However, plans for financing it are not yet developed. Architects are busy on the three housing projects for Chicago, but it may be late spring before construction will be started.

Cast Iron Pipe

Business remains dull, though many plans are under way for projects that anticipate the use of Government funds. There are also a number of projects on which applications have been filed at Washington.

Rails

Prospects are still drab, though most sellers hold to the opinion that tonnages not now announced will make their appearance in the early spring. No announcement has been made as to when the Burlington will purchase its 15,000 tons. The Southern Pacific will buy 26,000 tons, but it is very seldom that any part of its tonnage reaches the Chicago market. This business is usually placed with Southern mills and with producers on the Atlantic seaboard who ship by water to Gulf ports. Extreme cold weather is blanketing the country from the Ohio Valley to the Pacific Coast and track work is at a standstill in that area.

Cold-Rolled Strip

Output has not been changed from a week ago, but pressure for deliveries by consumers is more severe and production is to be increased before the week is out. Miscellaneous users are now in the market in earnest and their requirements are expanding at a rapid rate.

Sheets

The greatest pressure for deliveries is against cold-rolled products from automobile plants. More sheets are moving to farm implement manufacturers, and roofing plants are now entering orders and are starting to manufacture for spring delivery. Miscellaneous demand in the immediate Chicago area is now quite brisk.

Plates

Scattered business, usually in small tonnages, is all that is making its appearance. Wausau, Wis., will buy 850 tons of tank plates, and La Crosse, Wis., is in the market for 350 tons. Limited quantities of plates are going into railroad equipment. The Baltimore & Ohio will buy from 50 to 150 hopper cars and the Chilean State Railways will take figures on 21 passenger cars. The Milwaukee Road is well advanced at its Milwaukee shops on special coaches that will be used in high-speed train service.

Structural Material

Of special interest is 800 tons for a bridge for the Santa Fe railroad to be fabricated by the American Bridge Co. A number of post offices, some bridges and two industrial buildings in North Carolina complete an inquiry list that is not impressive.

Wire Products

Output has been fairly steady at 45 per cent of capacity, but producers look for an active spring trade and they are on the verge of expanding output in order to round out and enlarge stocks so that deliveries can be prompt on a wide variety of products. There is no lessening in the pressure for manufacturers' products and some improvement is noted in demand for woven wire fencing and nails. Some sellers who are looking beyond spring believe that fall business in rural districts will be exceptionally good.

Bars

Both new orders and specifications are the best since early last summer, and interest among buyers points to a still heavier demand. Automobile and farm implement output continues to expand, but equally as important is the very rapid growth in recent weeks of shipments to miscellaneous users.

Scrap

This market is experiencing a lull that obscures a clear view of the real drift of prices. The disposition to sell that developed with the break in prices is less acute, though here and there a tonnage is still being pushed into the market. The railroads are standing by and are holding accumulations against a time when prices will again rise. Consumption remains at a good level and all indications point to greater demand in the next six to eight weeks.

Heavy Demand for Cold-Rolled Sheets and Strip at New York

Some Mills Are Booked Full Until End of February—Export Demand Improves —Alloy and Stainless Steel Active

NEW YORK, Jan. 22.—Mills have accumulated heavy bookings in cold-rolled strip and cold-finished sheets and in some cases cannot offer deliveries before March 1. Demand for alloy steel bars and stainless steel strip is also active. The tin plate market is brisk so far as contracting is concerned, but mills are experiencing difficulty in obtaining releases.

The heavier rolled products continue to lag behind the lighter forms of steel, although a broadening export demand for storage tanks is accounting for a considerable tonnage of plates. In the railroad field, manufacturers of track accessories are busier, though prospective rail orders in this area are slow in materializing. Railroad equipment programs, considered out of the question a few months ago because of large car surpluses, are now receiving serious consideration. One large eastern line finds itself near the danger line so far as surplus serviceable cars are concerned, and is undecided as to whether to undertake a heavy freight car repair program or to purchase new rolling stock.

P. T. Cox Contracting Co., New York, is low bidder on the general contract for a section of the New York Central track depression work on the West Side of Manhattan from Forty-second to Fifty-third Streets. The steel requirements of this section total 1800 tons.

Signs of a revival of private financing of construction are seen in current inquiries for six apartment buildings in the Bronx and one in Brooklyn.

The price control hearings in Washington have again raised doubts as to the permanency of the open price system in effect under the steel code. If all price control is finally abandoned there will be some competitive compensations. Reciprocity, which has come to be one of the main considerations in placing orders, would no doubt lose much of its importance with the return of flexible prices.

Pig Iron

Foundries in this area are hopeful about business prospects, but they show no intention to translating these feelings into orders. Inasmuch as the inventory period is over, most iron sellers are considerably disappointed in the small volume of new business available. In the last seven days only 1250 tons of fresh business was received, mostly for spot shipment, as compared with 1800 tons in the previous period and 1500 tons booked two weeks earlier. The most encouraging feature of the present market is the steady influx of releases on contracts made since the first of the year. The trade has heard many contradicting rumors concerning the sale and shipment of Russian iron to seaboard points. The exclusive seller of this iron reports that trial bookings totaling about 500 tons have been made. However, none of this iron has yet been loaded in Russia. It is reported that the Federal Tariff Commission has under consideration some action on the selling of foreign iron at prices below those established by the code.

Reinforcing Steel

This market is currently very quiet. No large job was awarded during the past seven-day period, and even the volume of small miscellaneous demand has fallen to a low level. In addition to a few highway bridges which are still active, the only pending work of any consequence in this area consists of 1000 tons for New York Central Railroad improvements at New York, and 350 tons for parkway bridges in Queens, N. Y. Billet bars are 2.48c. a lb., for carlots delivered in this district, and rail steel bars are 2.33c. a lb. for carlots delivered.

Scrap

Major brokers continue to load steadily for shipment abroad. Supplies are tight. Small lots of No. 1 and No. 2 steels are bringing $9 and $7.50 a ton respectively, alongside barge, and in a few cases there is a little shading of these prices on the up-side. The stronger tone of heavy melting steel has reflected in higher quotations for unprepared material, which is now being bought at $5 in most cases. In addition to steel, brokers are also accumulating cast grades and stove plate for future export. Japan, Italy and Poland have all come into the market for light commitments, and it is reported that additional Swedish business has been placed. Inasmuch as most brokers have cleared their books of a considerable portion of old export business, the activity in this territory has not the snap of several months ago. This condition is accentuated by the current inclement weather, and also by the disinclination of small dealers to release sizable tonnages of material to the brokers.

Loan to Release Bridge Job in St. Louis District

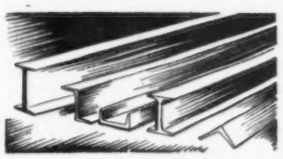
ST. LOUIS, Jan. 22.—Word has been received here that a PWA loan of $2,350,000 had been granted to the Wabash Railway to complete a two-track railroad bridge over the Missouri River at St. Charles, requiring approximately 8000 tons of structural steel. A portion of the structure, including piers, has been built. It is indefinite as to when bids will be asked. The Mississippi Valley Structural Steel Co. has been awarded 550 tons of structural steel for the Page Avenue viaduct, a Missouri Highway Commission project here. Buying of finished iron and steel is light, users limiting commitments to immediate requirements.

The volume of business done by iron and steel warehouses during 1934 is estimated to have been at least 30 per cent more than during 1933. Demand thus far in January is said to be better than it was at this time last year. Buying is general and is attributed to no one source.

Buying of pig iron continues good, and it is estimated that sales here during the last ten days have totaled between 5500 and 6000 tons. There is said to be considerable business being withheld pending a decision by the Supreme Court on the gold question. There has been a let-down by the stove industry as a whole, pending the completion of models for gas ranges, which will next occupy the industry's attention.

Although prices are unchanged, the scrap market is softer, causing local dealers to be more inclined to sell some of their holdings, but offerings are not large. There is a feeling that the market will go higher as soon as the Supreme Court decides the gold issue. Railroad lists: St. Louis - San Francisco, 2500 tons; Missouri Pacific, 70 carloads.

Automotive Industry Places Large Orders at Cleveland



Makers of Cold-Finished Sheets Are Five to Six Weeks Behind on Deliveries —Ingot Output Off Two Points to 67 Per Cent

CLEVELAND, Jan. 22.—With increased production schedules for February, the automotive industry is placing large orders for sheets, strip steel and bars for delivery next month and the pressure for shipments of steel on mill books is unabated. Deliveries have been extended by some mills to five or six weeks on cold-finished sheets and have slowed down on hot-rolled strip. Most producers are able to make fairly prompt delivery of bars. Miscellaneous demand for sheets has broadened, this coming largely from manufacturers of household equipment.

Owing to the temporary shutting down for repairs of an open-hearth furnace by one of the Cleveland mills that has been operating its steel plant at 100 per cent of capacity, ingot output in the Cleveland-Lorain territory dropped two points this week to 67 per cent of capacity.

Activity in the construction field continues slack and gives little promise of early improvement. Public projects, according to present indications, will have to supply most of the work in this field for some time.

Railroad buying is limited to small lots of steel for bridge repair work. The Chesapeake & Ohio is not expected to have its rail inquiry out before spring, and other railroads centering here may not purchase their 1935 rails for some time.

Pig Iron

Shipping orders are holding up to the recent heavy volume, but new sales have declined, which was to be expected because many consumers in making purchases recently have covered for the remainder of the quarter or for more iron than required for immediate needs. Others are buying car lots as required. Average operations of foundries doing jobbing work and making miscellaneous products have gained this month, although some foundries have not experienced an improvement in their business.

Sheets

There is a steady and heavy volume of new business from the automotive industry and deliveries are being further extended. Some mills are not promising shipments on full-finished cold-rolled sheets for five or six weeks. Demand outside of the automotive field is good, particularly for enameling sheets. Makers of kitchen equipment have become more active. There is talk of upward price revisions on cold-finished sheets for the second quarter.

Reinforcing Bars

Bids for 1100 tons of reinforcing bars for the Muskingum, Ohio, district conservation project have been rejected by the United States Engineers, and new bids will be taken about March 1. The quantity is to be increased, as new bids will include bars for two additional dams in connection with this project. The United States Engineers are reported to have objected because all bids were uniform, to which bidders retorted that compliance with the code necessitated uniform delivered prices.

Strip Steel

Specifications for wide cold-rolled strip from the automotive industry continues heavy, although new business fell off slightly the past week. Demand for strip under 4 in. wide is not very active. Hot-rolled strip is in heavy demand from cold rolling plants not having hot mills, and some producers are two weeks behind on deliveries.

Iron Ore

Stocks of Lake Superior ore at furnaces and Lake Erie docks Jan. 1 were 34,373,002 tons, or only slightly less than on the same date last year, when stocks amounted to 34,673,149 tons. Ore consumed in December amounted to 1,505,751 tons, an increase for the month of 207,347 tons. This compares with 1,597,680 tons consumed in December, 1933. Furnace stocks Jan. 1 amounted to 29,217,671 tons. Central district furnaces in December consumed 750,199 tons, an increase for the month of 103,563 tons. Lake front furnaces melted 750,757 tons, a gain of 103,537 tons over November. All-rail furnaces used 4795 tons, an increase of 281 tons, and Eastern furnaces used no Lake ore during December. There were 62 furnaces in blast using Lake ore Dec. 31, a gain of six for the month.

Bars, Plates and Shapes

Demand for bars continues heavy, with most of the business coming from the automotive field. Orders from makers of road machinery have improved. Mill orders for structural steel have materially increased because of the release of specifications for bridge work placed with fabricators some time ago. The only new award is 120 tons for the Portsmouth, Ohio, post office. New inquiry in the construction field is light. Activity in plates is limited.

Scrap

A small tonnage of blast furnace scrap was purchased by a Cleveland mill during the week at a reported price of $9 a ton, or an advance of $1 a ton over the price recently paid by another Cleveland consumer for blast furnace grades. Dealers are paying $8.50 for scrap to cover the last order. The 30,000 tons of steel-making scrap reported purchased by the National Tube Co. in the Pittsburgh market for its Lorain works will, it is understood, all be shipped by water from various Lake ports, necessitating delay in deliveries until after the opening of the season of navigation. Local mills are figuring on additional scrap purchases. Blast furnace scrap has advanced 50c. a ton. Other grades are unchanged.

Boston Scrap Prices Continue to Strengthen

BOSTON, Jan. 22.—A further strengthening in prices for certain kinds of scrap is noted. No. 1 heavy melting steel, No. 2 steel and steel turnings for Pennsylvania delivery are up 25c. a ton, while offers up to $8.25 a ton have been made for T-rails, 50c. above the previous high price. For bundled skeleton and similar scrap not more than $6.20 a ton, f.o.b., has been paid. Shipments to Pennsylvania are beginning to pick up, but interest still centers very largely in the export market. One steamer with 3900 tons for Ardrossan, Scotland, left here last week, and two steamers expect to finish loading this week. At Providence, R. I., a boat with 4500 tons of bulky scrap is about to clear.

Business in pig iron is confined to scattered carlots and truckloads.

Philadelphia Operations Six Points Higher at 35 Per Cent

Miscellaneous Demand Improves in This District — Lavino Furnace Co. Will Light Virginia Stack—Scrap Prices Unchanged

PHILADELPHIA, Jan. 22. — Consumer buying here continues to be of a miscellaneous character, although the aggregate tonnage being booked is undeniably better than that which appeared early in January. Sellers in this area do not enjoy the large automobile outlet which is so evident farther west. However all the industries here have permitted plant equipment and buildings to deteriorate to such an extent that the current lift in general business has necessitated widespread rehabilitation. It is from this source that this district is deriving most of its present strength.

Operations of the smaller mills in eastern Pennsylvania are unchanged from a week ago and continue to be far below normal. But the current heavy demand for automobile sheets, tin plate and spring wire has been reflected in better operations for Bethlehem, which in turn has lifted the district's aggregate rate up to 35 per cent. The three Pencoyd furnaces will be down for most of the week, and the light structural mill there is operating two turns each day. Present schedules call for operation of the large mill next week.

Practically every mill here is equipped to roll plates, but the demand for this product is currently at a very low level. Sellers experienced a slightly better miscellaneous demand last week, and local shipyards have entered modest requirements for repair work on boats forced in by the recent severe Atlantic storms.

Warehouses continue to operate on stocks about 15 per cent below normal. It is believed that demands from this direction will increase before the end of the quarter.

Structural steel inquiries have dropped to a low point, and the immediate future does not appear encouraging, as projects in New Jersey and Pennsylvania are being delayed. This condition arises from the fact that the present time is an off season for this type of work and also because of the inactivity caused by administration changes in both the States.

Pig Iron

Furnace representatives report a slight upturn in demand during the past seven days. It is estimated that aggregate activity is now at about the level established last October and November. The Troy stack has taken care of most of the basic requirements of this district and foreign sellers have picked up the remainder. Consequently current demand is almost entirely for foundry grades. Sales vary from carlots to 500 tons, with prompt delivery specified in most cases. Recently 400 tons of off-grade iron was sold for ship ballast. Seemingly the importance of Russian iron along the seaboard has been considerably exaggerated. The only seller of this material reports that one trial lot of 500 tons has been booked. None of this tonnage has yet been loaded in Russia. Inasmuch as rising steel production has increased the market for ferroalloys, the Lavino Furnace Co. has plans under way to blow in its Reusens, Va., stack early in February. This furnace makes ferromanganese and some spiegeleisen.

Sheets

Although this district is not a large consumer of full-finished sheets, the steady purchases of local autobody plants have resulted in better activity for this type of steel. Air-conditioning manufacturers are also in the market for more material. The heavy demands in the West for automobile sheets have thrown delivery dates further ahead. Several mills have notified salesmen here not to accept first quarter commitments on auto sheets and certain grades of strip. The small mills in this area also report that miscellaneous orders for blue-annealed sheets have been more encouraging. This demand is coming mostly from makers of light tanks, stove makers, etc.

Bars, Plates and Shapes

Although aggregate inquiry for plates is still far from satisfactory, district sellers report that current demand is somewhat more encouraging. No one outlet is conspicuous, although requirements for general ship repairs are slightly better and miscellaneous demand is up somewhat, although still very spotty. The Ordnance Bureau of the Navy Department will

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open bids on Jan. 28 for 1479 tons of armor plate for the cruisers Honolulu, Wichita, Phoenix and Boise. Consumer demand for bars and shapes continues to be far under the level of last fall. New projects are so scarce that sellers are finding difficulty in keeping estimators busy. There were no large bar awards during the past week. Active tonnages include 150 tons for a Radmor, Pa., bridge, and 400 tons for buildings at the Philadelphia Navy Yard. The American Bridge Co. will furnish 100 tons of shapes for a Tioga County, Pa., bridge, and McClintic-Marshall Corpn. was awarded 160 tons for a bridge in Chester County, Pa. New projects include a North Philadelphia post office requiring 500 tons, bids due Feb. 1, and five New Jersey bridges aggregating 600 tons, on which general contract bids will be taken during the next month.

Imports

The following iron and steel imports were received here last week: 275 tons of pig iron from British India; 41 tons of steel wire, 22 tons of steel bars, 20 tons of steel tubes, 16 tons of steel forgings and 1 ton of steel rods from Sweden, and 14 tons of structural shapes and 3 tons of steel bars from Belgium.

Scrap

The domestic market is marking time, but dealers here insist that some significant business will mature during the next two weeks. A few additional orders of No. 1 steel have been placed at $12, and one eastern Pennsylvania mill took a sizable lot of No. 2 last week at $10.50. Heavy breakable cast is slightly higher at $10.50 to $11 on the strength of several recent purchases. Pencoyd has ordered some cast grades, and is reported to be feeling out the market on steel. At Baltimore, steel is still available at $10.50 for delivery to Sparrows Point, Md., although much of the material there is being accumulated for an export boat which is expected in shortly. At Port Richmond export activity is again as brisk as it was late last year. Two boats of steel are about loaded and another boat is expected in on Jan. 28. Cast iron and stove plate for export are not so active here at the present time, as accumulations of these grades for England are being made in New England and at points farther south.

Reinforcing Steel

Awards 6750 Tons—New Projects 2560 Tons

Revere, Mass., 140 tons, Point of Pine bridge, to Northern Steel Co.

State of Illinois, 130 tons, bridge, to Joseph T. Ryerson & Son, Inc.

Oakland, Cal., 432 tons, Continental Can Co. factory, to Soule Steel Co.

Okanogan County, Wash., 109 tons, State bridge over Methow River, to Northwest Steel Rolling Mills Co.

Los Angeles, 5830 tons of bars, Metropolitan Water District, Specification M-2037; 2075 tons each of rail reinforcing bars, to Truscon Steel Co. and Security Materials Co., and 1680 tons of billet bars, to Soule Steel Co.

NEW REINFORCING BAR PROJECTS

Radmor, Pa., 150 tons, bridge; bids in.

State of Illinois, 350 tons, highway bridges.

State of Ohio, 160 tons, Warren County bridge; W. H. Crawford & Son, Wilmington, Ohio, general contractors.

Milwaukee, 4000 tons, filter plant; bids rejected and job will be readvertised.

Flathead County, Mont., 102 tons, two State bridges; bids Jan. 25.

State of Montana, 192 tons, highway work in four counties; bids Jan. 25.

San Francisco, 1200 tons approximately, Marina Junior High School; bids soon.

State of California, 300 tons, five post office buildings in northern section; bids Feb. 2.

Los Angeles, 5660 tons, material for Metropolitan Water District; identical bids received.

State of Oregon, 248 tons, highway work in five counties; bids Jan. 31.

20 REASONS WHY

Anaconda Free Cutting Brass Rod is an

IDEAL METAL

for Screw Machine Products

A *new* edition of Anaconda Publication B-14 goes thoroughly into details. It treats of tool life, tool breakage, power consumption and the many other factors that help determine the ultimate cost of screw machine parts.

Special cold drawn and extruded shapes, that save their metal cost many times over by eliminating expensive milling and other machining operations, are reviewed in detail.

In addition to Brass, Anaconda Free Cutting Phosphor Bronze, Nickel Silver, Everdur, and other Anaconda Free Cutting Alloys are also discussed.

If you make, sell, buy or use screw-machine parts of *any metal*, you'll want this booklet. For your copy, mail the coupon today.

ANACONDA
from mine to consumer

HERE ARE 3 REASONS

No. 4

The production ratio of brass rod is at least 4 to 1 as compared with cold rolled Bessemer steel screw stock.

No. 8

Tool life on brass is from 4 to 8 times longer than on steel.

No. 11

Small tool breakage is considerably less when machining brass rod in an automatic screw machine.

ANACONDA COPPER & BRASS

IA1

THE AMERICAN BRASS COMPANY, Waterbury, Conn.

Please send me a free copy of your new Brass Rod Booklet, Anaconda Publication B-14, by return mail.

Name _____ Title _____

Company _____

City _____ State _____

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

	Soft Steel	*Base per Lb.*
F.o.b.	Pittsburgh	1.80c.
F.o.b.	Chicago	1.85c.
F.o.b.	Gary	1.85c.
F.o.b.	Duluth	1.95c.
Del'd	Detroit	1.95c.
F.o.b.	Cleveland	1.85c.
F.o.b.	Buffalo	1.90c.
Del'd	Philadelphia	2.09c.
Del'd	New York	2.13c.
F.o.b.	Birmingham	1.95c.
F.o.b.	cars dock Gulf ports	2.20c.
F.o.b.	cars dock Pacific ports	2.35c.

Rail Steel

(For merchant trade)

F.o.b.	Pittsburgh	1.70c.
F.o.b.	Chicago	1.75c.
F.o.b.	Gary	1.75c.
F.o.b.	Moline, Ill.	1.75c.
F.o.b.	Cleveland	1.75c.
F.o.b.	Buffalo	1.80c.
F.o.b.	Birmingham	1.85c.
F.o.b.	cars dock Gulf ports	2.10c.
F.o.b.	cars dock Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b.	Pittsburgh	2.05c.
F.o.b.	Chicago	2.10c.
F.o.b.	Gary	2.10c.
Del'd	Detroit	2.20c.
F.o.b.	Cleveland	2.10c.
F.o.b.	Youngstown	2.10c.
F.o.b.	Buffalo	2.10c.
F.o.b.	Birmingham	2.10c.
F.o.b.	cars dock Gulf ports	2.45c.
F.o.b.	cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b.	Pittsburgh	1.90c.
F.o.b.	Chicago	1.95c.
F.o.b.	Gary	1.95c.
F.o.b.	Cleveland	1.95c.
F.o.b.	Youngstown	1.95c.
F.o.b.	Buffalo	1.95c.
F.o.b.	Birmingham	1.95c.
F.o.b.	cars dock Gulf ports	2.30c.
F.o.b.	cars dock Pacific ports	2.30c.

Iron

F.o.b.	Chicago	1.80c.
F.o.b.	Terre Haute, Ind.	1.75c.
F.o.b.	Louisville, Ky.	2.10c.
F.o.b.	Danville, Pa.	1.80c.
F.o.b.	Berwick, Pa.	1.70c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.10c.
F.o.b. Chicago	2.15c.
F.o.b. Gary	2.15c.
F.o.b. Cleveland	2.15c.
F.o.b. Buffalo	2.20c.
Del'd Detroit	2.30c.
Del'd eastern Michigan	2.35c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts

	Base per Net Ton
F.o.b. Pittsburgh	$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston, Orange, Beaumont, Galveston	59.00
F.o.b. Mobile	58.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	59.00
F.o.b. cars dock Pacific ports	63.00

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.985c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.985c.
Del'd New York	2.08c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.985c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.005c.
Del'd New York	2.0525c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.14c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. dock cars Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.60c.
No. 24, del'd Phila.	2.69c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. dock cars Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, del'd Detroit	2.70c.
No. 10 gage, del'd Phila.	2.79c.
No. 10 gage, f.o.b. Birmingham	2.65c.
No. 10 gage, f.o.b. dock cars Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Phila.	3.24c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20 gage, f.o.b. dock cars Pacific ports	3.50c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.39c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. dock cars Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock, Pacific Coast ports	3.35c.

Tin Plate *Per Base Box*

Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	2.10c.
Cooperage stock, Chicago	2.20c.

Cold-Rolled Strips

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.88c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

Hot-Rolled Rail Steel Strips

	Base per Lb.
F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade	*Per Lb.*
Bright wire	2.30c.
Spring wire	2.90c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To Jobbing Trade

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

	Base per Keg
Standard wire nails	$2.60
Smooth coated nails	2.60
Galvanized nails:	
15 gage and coarser	4.60
16 gage and finer	5.10

	Base per 100 Lb.
Annealed fence wire	$2.45
Galvanized fence wire	2.80
Polished staples	3.30
Galvanized staples	3.55
Barbed wire, galvanized	3.00
Woven wire fence, base column	63.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh, while Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

On staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

	Off List
F.o.b. Pittsburgh	35 and 2½ off
F.o.b. Chicago	35 off

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel Inches	Black	Galv.	*Wrought Iron* Inches	Black	Galv.
⅛	51½	29⅝	⅛	+91½	+138
¼ to ⅜	53½	35	¼ & ⅜	+1½	+21½
½	58½	47	½	31½	15
¾	62	52	¾	36½	20½
1 to 3	64	55	1 & 1¼	39½	25½
			1½	43½	28
			2	41½	26

Lap Weld

2	60	51	2	37	22½
2½ to 3	63	54	2½ to 3½	38	25
3½ to 6	65	56	4 to 8	40	28½
7 and 8	64	54	9 to 12	38	24½
9 and 10	63½	53½			
11 and 12	62½	52½			

Butt Weld, extra strong, plain ends

⅛	48½	33½	⅛	+13	+45½
¼ to ⅜	51	38	¼ & ⅜	+2½	+34½
½	56½	47½	½	32½	17½
¾	61	52	¾	37½	22½
1 to 3	63	55	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	58	50	2	40	26
2½ to 3	62	54	2½ to 4	45½	33
3½ to 6	65½	57½	4½ to 6	45	33½
7 and 8	64½	54½	7 & 8	46	33
9 and 10	63½	53½	9 to 12	41½	30
11 and 12	62½	52½			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 8.60	$7.82
1¼ in. o.d.	13 B.W.G.	10.19	9.26
1½ in. o.d.	13 B.W.G.	11.26	10.33
1¾ in. o.d.	13 B.W.G.	12.81	11.64
2 in. o.d.	13 B.W.G.	14.35	13.04
2¼ in. o.d.	13 B.W.G.	16.00	14.54
2½ in. o.d.	12 B.W.G.	19.29	17.54
2¾ in. o.d.	12 B.W.G.	20.45	18.59
3 in. o.d.	12 B.W.G.	21.45	19.50
3¼ in. o.d.	11 B.W.G.	25.22	22.93
3½ in. o.d.	11 B.W.G.	27.09	24.63
4 in. o.d.	10 B.W.G.	33.60	30.54
4½ in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.96

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
10,000 lb. or ft. to 24,999 lb. or ft.	12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	25 %
Under 2,000 lb. or ft.	40 %

Hot-Finished Lapweld Steel Pressure Tubes

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

1½ in. o.d.	13 B.W.G.	$ 9.73
1¾ in. o.d.	13 B.W.G.	11.06
2 in. o.d.	13 B.W.G.	12.38
2¼ in. o.d.	13 B.W.G.	13.79
2½ in. o.d.	12 B.W.G.	16.58
2¾ in. o.d.	12 B.W.G.	17.54
3 in. o.d.	12 B.W.G.	18.35
3¼ in. o.d.	11 B.W.G.	21.56
3½ in. o.d.	11 B.W.G.	23.15
4 in. o.d.	10 B.W.G.	28.66
4½ in. o.d.	10 B.W.G.	35.22
5 in. o.d.	9 B.W.G.	44.35
6 in. o.d.	7 B.W.G.	68.14

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5 %
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25 %
Under 2,000 lb. or ft.	plus 40 %

CHARCOAL IRON BOILER TUBES

Base Discounts, f.o.b. Pittsburgh

In. O. D.	
1½ and 1¾	44
2 —2¼	13 and 10
2½—2¾	16 and 10
3	17 and 10
3¼—3½	18 and 10
4	20 and 10
4½, 5, 6	21 and 10

Extras for quantity: For 1½ to 1¾, up 8 points under 10,000 lb., up 4 points 10,000 lb. to carload. For 2 in. to 5½ in., up 2 points without supplementary 10 per cent, under 10,000 lb.; supplementary 5 per cent instead of supplementary 10 per cent for 10,000 lb. to carload.

In sizes 2 in. to 4½ in. O.D. inclusive, all tubes more than four gages heavier than standard are priced per lb. as follows: Carload and over, 9c.; extras for quantity—under 10,000 lb. 1c. per lb., 10,000 lb. to carload ½c. per lb.

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	$47.00
*4-in., del'd Chicago	50.00
6-in. and larger, del'd New York	45.00
4-in. del'd New York	48.00
6-in. and larger, Birmingham	39.00
4-in. Birmingham	42.00

Class "A" and gas pipe, $3 extra

*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $46 and 4-in. pipe $49 a ton, delivered Chicago.

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.40
Spikes, ½ in. and smaller	2.40
Spikes, boat and barge	2.40
Tie plates, steel	1.90
Tie plates, Pacific Coast ports	2.00
Track bolts, to steam railroads	2.55
Track bolts, no jobbers, all sizes (per 100 count)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va., Jersey City, N. J.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine bolts .....70, 10 and 10
Carriage bolts .....70, 10 and 10
Lag bolts .....70, 10 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads .....70, 10 and 10
Hot-pressed nuts, blank or tapped, square .....70, 10 and 10
Hot-pressed nuts, blank or tapped, hexagons .....70, 10 and 10
C.p.c. and t. square or hex. nuts, blank or tapped .....70, 10 and 10
Semi-finished hexagon nuts, U.S.S. all sizes .....70, 10 and 10
Semi-finished hexagon nuts, S.A.E. ¼ in. to 7/16 in. diameter..75, 10 and 10
½ in. to 1 in. diameter..75, 10 and 10
larger than 1 in. diameter..75, 10 and 10
Stove bolts 11 packages, Pittsburgh.. 75
Stove bolts in packages, Chicago..... 75
Stove bolts in packages, Cleveland.... 75
Stove bolts in bulk, P'gh..... 83
Stove bolts in bulk, Chicago..... 83
Stove bolts in bulk, Cleveland..... 83
Tire bolts .....60 and 10

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland.....$2.90
F.o.b. Chicago 3.00
F.o.b. Birmingham 3.05

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh .....70 and 5
F.o.b. Cleveland .....70 and 5
F.o.b. Chicago and Birm'g'm....70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller .....80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller.....75
Milled headless set screws, cut thread ¾ in. and smaller 75
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller 85
Upset set screws, cut and oval point .....75 and 10 to 80
Milled studs .....65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped.....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.

Alloy Steel Bars

Price del'd Detroit is $52.
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base.....2.45c.
Delivered price at Detroit is.....2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (1¼% Nickel)	$0.25
2100 (2½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.20% C)

(Base Prices, f.o.b. Pittsburgh)

Per Lb.

Forging billets .....19.55c.
Rerolling slabs ..... 15c.
Bars ..... 23c.
Plates ..... 26c.
Structural shapes ..... 23c.
Sheets ..... 33c.
Hot-rolled strip .....20¾c.
Cold-rolled strip ..... 27c.
Drawn wire ..... 23c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped.....$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham.
Uncropped.....$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

Per Gross Ton

Rerolling $27.00
Forging quality 32.00

Delivered Detroit

Rerolling $30.00
Forging 35.00

Billets Only F.o.b. Duluth

Rerolling $29.00
Forging 34.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open-hearth or Bessemer.....$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved ..... 1.70c.
Universal ..... 1.70c.
Sheared ..... 1.70c.

Tube Rounds

Base per Lb.

F.o.b. Pittsburgh ..... 1.80c.
F.o.b. Chicago ..... 1.85c.
F.o.b. Cleveland ..... 1.85c.
F.o.b. Buffalo ..... 1.90c.
F.o.b. Birmingham ..... 1.95c.

Wire Rods

(Common, base)

Per Gross Ton

F.o.b. Pittsburgh $38.00
F.o.b. Cleveland 38.00
F.o.b. Chicago 39.00
F.o.b. Anderson, Ind. 39.00
F.o.b. Youngstown 39.00
F.o.b. Worcester, Mass. 40.00
F.o.b. Birmingham 41.00
F.o.b. San Francisco 47.00
F.o.b. Galveston 44.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$19.50	$20.00	$19.00	$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	.....	.....	19.00	.....
Sparrows Point, Md.	19.50	.....	19.00	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	.....
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	.....
Duluth, Minn.	19.00	19.00	.....	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	....	17.00	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District From Everett, Mass.	$20.00	$20.50	$19.50	$21.00
Brooklyn From East Pa. or Buffalo	21.77	22.27	21.27	22.77
Newark or Jersey City, N. J. From East. Pa. or Buffalo	20.89	21.39	20.39	21.89
Philadelphia From Eastern Pa.	20.26	20.76	19.76	21.26
Cincinnati From Hamilton, Ohio	19.51	19.51	19.01	20.01
Canton, Ohio From Cleveland and Youngstown	19.76	19.76	19.26	20.26
Columbus, Ohio From Hamilton, Ohio	20.50	20.50	.....	.....
Mansfield, Ohio From Cleveland and Toledo	20.26	20.26	.....	.....
Indianapolis From Hamilton, Ohio	20.77	20.77	.....	.....
South Bend, Ind. From Chicago	20.55	20.55	.....	.....
Milwaukee From Chicago	19.50	19.50	.....	.....
St. Paul From Duluth	20.94	.....	.....	.....
Davenport, Iowa From Chicago	20.26	20.26	.....	.....
Kansas City From Granite City	21.04	21.04	.....	.....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.....$23.50

GRAY FORGE PIG IRON

Valley furnace $18.00
Pittsburgh district furnace 18.00

CHARCOAL PIG IRON

Lake Superior furnace $21.00
Delivered Chicago 24.04
Delivered Buffalo 24.28

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75.....$21.00
No. 2 fdy., sil. 1.75 to 2.75..... 20.50
Malleable 21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75.....$22.50
No. 2 fdy., sil. 1.75 to 2.25..... 22.00
Malleable 22.50
Basic 22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $85.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....$26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads) $77.50
50% (ton lots) 85.00
75% (carloads) 126.00
75% (ton lots) 136.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads) (duty paid).... $1.00
14% to 16% (less carloads)..... 38.50

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$22.75	12%	$29.25
7%	23.75	13%	30.75
8%	24.75	14%	32.25
9%	25.75	15%	33.75
10%	26.75	16%	35.25
11%	27.75	17%	36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$27.75	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 1½ to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W, del., carloads .....$1.35 to $1.45
Ferrotungsten, less carloads. 1.45 to 1.55
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads 10.00c
Ferrochromium, 2% carbon .....16.50c. to 17.00c
Ferrochromium, 1% carbon .....17.50c. to 18.00c
Ferrochromium, 0.10% carbon .....19.50c. to 20.00c
Ferrochromium, 0.06% carbon .....20.00c. to 20.50c
Ferrovanadium, del., per lb. contained V.....$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton $137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage..... 50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage..... 65.00
Ferromolybdenum, per lb. Mo., del. 95c.
Calcium molybdate, per lb. Mo., del. ..... 80c.
Silico spiegel, per ton, f.o.b. furnace, car lots $38.00
Ton lots or less per ton..... 45.50
Silico-manganese, gross ton, delivered:
2.50% carbon grade 90.00
2% carbon grade 95.00
1% carbon grade 105.00
Spot prices .....$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$13.00 to $14.00
No. 2 heavy melting steel	12.00 to 12.50
No. 2 railroad wrought	13.00 to 13.50
Scrap rails	13.00 to 13.50
Rails 3 ft. and under	14.50 to 15.00
Compressed sheet steel	12.75 to 13.25
Hand bundled sheet steel	12.00 to 12.50
Hvy. steel axle turnings	10.00 to 10.50
Machine shop turnings	9.00 to 9.50
Short shov. turnings	9.00 to 9.50
Short mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron carwheels	12.75 to 13.25
Heavy breakable cast	12.25 to 12.75
No. 1 cast	13.00 to 13.50
Railr. knuckles and couplers	14.50 to 15.00
Rail, coil and leaf springs	14.50 to 15.00
Rolled steel wheels	14.50 to 15.00
Low phos. billet crops	15.00 to 15.50
Low phos. sheet bar crops	15.00 to 15.50
Low phos. plate scrap	13.50 to 14.00
Low phos. punchings	14.00 to 14.50
Steel car axles	15.00 to 15.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$11.50 to $12.00
Automobile hvy. melt. steel	11.00 to 11.50
Shoveling steel	11.50 to 12.00
Hydraulic comp. sheets	10.50 to 11.00
Drop forge flashings	10.50 to 11.00
No. 1 busheling	10.50 to 11.00
Rolled carwheels	13.00 to 13.50
Railroad tires	13.00 to 13.50
Railroad leaf springs	13.00 to 13.50
Axle turnings	11.00 to 11.50
Steel couplers and knuckles	13.00 to 13.50
Coil springs	13.00 to 13.50
Axle turnings (elec. fur.)	11.00 to 11.50
Low phos. punchings	13.00 to 13.50
Low phos. plates, 12 in. and under	14.00 to 14.50
Cast iron borings	7.00 to 7.50
Short shoveling turnings	7.00 to 7.50
Machine shop turnings	5.50 to 6.00
Rerolling rails	12.50 to 13.00
Steel rails, less than 3 ft.	14.00 to 14.50
Steel rails, less than 2 ft.	14.50 to 15.00
Angle bars, steel	13.00 to 13.50
Cast iron carwheels	12.00 to 12.50
Railroad malleable	14.00 to 14.50
Agricultural malleable	10.00 to 10.50

Per Net Ton

Iron car axles	$16.50 to $17.00
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	10.50 to 11.00
No. 2 railroad wrought	10.50 to 11.00
No. 2 busheling	5.50 to 6.00
Locomotive tires, smooth	10.00 to 10.50
Pipe and flues	5.50 to 6.00
No. 1 machinery cast	11.00 to 11.50
Clean automobile cast	11.00 to 11.50
No. 1 railroad cast	10.00 to 10.50
No. 1 agricultural cast	9.50 to 10.00
Stove plate	6.50 to 7.00
Grate bars	6.50 to 7.00
Brake shoes	7.25 to 7.75

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$11.50 to $12.00
No. 2 heavy melting steel	10.00 to 10.50
No. 1 railroad wrought	11.00 to 11.50
Bundled sheets	9.00
Hydraulic compressed, new	10.00 to 10.50
Hydraulic compressed, old	6.50 to 7.00
Machine shop turnings	6.50 to 7.00
Heavy axle turnings	8.50 to 9.00
Cast borings	5.00 to 5.50
Heavy breakable cast	10.50 to 11.00
Stove plate (steel works)	8.50 to 9.00
No. 1 low phos. heavy	15.00 to 15.50
Couplers and knuckles	14.00 to 14.50
Rolled steel wheels	14.00 to 14.50
No 1 blast furnace	5.00 to 5.50
Spec. iron and steel pipe	8.00
Shafting	17.00 to 17.50
Steel axles	16.50 to 17.00
No. 1 forge fire	9.00
Cast iron car wheels	11.50 to 12.00
No. 1 cast	11.00 to 11.50
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	12.00

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$9.00 to $9.50
Scrap rails for melting	9.00 to 9.50
Loose sheet clippings	6.50 to 7.00
Bundled sheets	7.00 to 7.50
Cast iron borings	5.50 to 6.00
Machine shop turnings	5.50 to 6.00
No. 1 busheling	7.00 to 7.50
No. 2 busheling	3.75 to 4.25
Rails for rolling	10.00 to 10.50
No. 1 locomotive tires	8.25 to 8.75
Short rails	12.50 to 13.00
Cast iron carwheels	9.00 to 9.50
No. 1 machinery cast	10.25 to 10.75
No. 1 railroad cast	9.50 to 10.00
Burnt cast	7.00 to 7.50
Stove plate	7.00 to 7.50
Agricultural malleable	9.00 to 9.50
Railroad malleable	10.00 to 10.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$11.00 to $11.50
No. 2 heavy melting steel	10.50 to 11.00
Compressed sheet steel	10.50 to 11.00
Light bundled sheet stampings	8.50 to 9.00
Drop forge flashings	9.50 to 10.00
Machine shop turnings	7.00 to 7.50
Short shoveling turnings	7.50 to 8.00
No. 1 busheling	9.50 to 10.00
Steel axle turnings	9.50 to 10.00
Low phos. billet crops	14.50 to 15.00
Cast iron borings	8.00 to 8.50
Mixed borings and short turnings	8.00 to 8.50
No. 2 busheling	8.00 to 8.50
No. 1 cast	12.50 to 13.00
Railroad grate bars	7.00 to 7.50
Stove plate	8.00 to 8.50
Rails under 3 ft.	15.00 to 15.50
Rails for rolling	15.50 to 18.00
Railroad malleable	12.00 to 12.50
Cast iron carwheels	12.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$11.50 to $12.00
No. 2 heavy melting scrap	10.50 to 11.00
Scrap rails	11.00 to 11.50
New hydraul. comp. sheets	10.50 to 11.00
Old hydraul. comp. sheets	8.75 to 9.25
Drop forge flashings	10.50 to 11.00
No. 1 busheling	10.50 to 11.00
Hvy. steel axle turnings	7.00 to 7.50
Machine shop turnings	5.75 to 6.25
Knuckles and couplers	13.00 to 13.50
Coil and leaf springs	13.00 to 13.50
Rolled steel wheels	13.00 to 13.50
Low phos. billet crops	13.25 to 13.75
Short shov. steel turnings	6.75 to 7.25
Short mixed borings and turnings	6.75 to 7.25
Cast iron borings	6.75 to 7.25
No. 2 busheling	6.50 to 7.00
Steel car axles	12.00 to 12.50
Iron axles	12.00 to 12.50
No. 1 machinery cast	12.00 to 12.50
No. 1 cupola cast	10.00 to 10.50
Stove plate	10.00 to 10.50
Steel rails, 3 ft. and under	13.50 to 14.00
Cast iron carwheels	11.00 to 11.50
Industrial malleable	12.50 to 13.00
Railroad malleable	12.50 to 13.00
Chemical borings	7.00 to 7.50

BOSTON

Dealers' buying prices per gross ton:

*No. 1 heavy melting steel	$9.00 to $9.25
No. 1 heavy melting steel	7.50 to 7.75
Scrap T rails	7.75 to 8.25
*No. 2 steel	8.00 to 8.25
No. 2 steel	6.50 to 7.00
Breakable cast	6.50 to 6.75
Machine shop turnings	3.00 to 3.25
Bundled skeleton, long	6.00 to 6.20
Forge flashings	6.00 to 6.20
Shafting	11.50 to 12.00
Steel car axles	11.50 to 12.00
Cast iron borings, chemical	6.50 to 7.00
Stove plate	4.00 to 4.25

Per gross ton delivered consumers' yards:

Textile cast	$9.00 to $9.50
No. 1 machinery cast	9.00 to 9.50
Stove plate	6.00 to 6.50
Railroad malleable	11.00 to 11.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	*$7.50 to †$9.00
No. 2 heavy melting steel	*6.00 to †7.50
Heavy breakable cast	6.75 to 7.25
No. 1 machinery cast	7.50 to 8.00
No. 2 cast	6.50 to 7.00
Stove plate	6.00 to 6.25
Steel car axles	12.50 to 13.00
No. 1 railroad wrought	7.50 to 8.00
No. 1 yard wrought, long	6.50 to 7.00
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for rolling	9.00 to 9.50
Short shoveling turnings	2.50 to 3.00
Machine shop turnings	2.50 to 3.00
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	4.50 to 5.00

Per gross ton, delivered local foundries:

No. 1 machinery cast	$10.50
No. 1 hvy. cast (cupola size)	9.50
No. 2 cast	8.00

*For direct car loading only.
†Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$9.00
Scrap steel rails	10.00
Short shoveling turnings	6.50
Stove plates	6.50
Steel axles	10.00 to 10.50
Iron axles	10.00 to 10.50
No. 1 railroad wrought	6.50
Rails for rolling	11.00 to 12.00
No. 1 cast	9.50 to 10.00
Tramcar wheels	9.00 to 9.50
Cast iron borings, chem.	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$9.25 to $9.75
No. 1 heavy melting	8.50 to 9.00
No. 2 heavy melting	7.50 to 8.00
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	10.00 to 10.50
Railroad springs	11.00 to 11.50
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	9.25 to 9.75
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	2.50 to 3.00
Rails for rolling	11.00 to 11.50
Machine shop turnings	2.50 to 3.00
Heavy turnings	5.50 to 6.00
Steel car axles	13.50 to 14.00
Iron car axles	13.50 to 14.00
No. 1 railroad wrought	7.50 to 8.00
Steel rails less than 3 ft.	11.75 to 12.25
Steel angle bars	9.50 to 10.00
Cast iron carwheels	8.25 to 9.25
No. 1 machinery cast	9.00 to 9.50
Railroad malleable	10.00 to 10.50
No. 1 railroad cast	9.00 to 9.50
Stove plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	$9.00 to $9.50
Borings and short turnings	5.50 to 6.00
Long turnings	$5.00 to $5.50
No. 1 machinery cast	10.50 to 11.00
Automotive cast	10.75 to 11.25
Hydraul. comp. sheets	9.50 to 10.00
Stove plate	6.50 to 7.00
New factory busheling	7.75 to 8.25
Old No. 2 busheling	5.00 to 5.50
Sheet clippings	6.00 to 6.50
Flashings	8.50 to 9.00
Low phos. plate scrap	9.75 to 10.25

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$5.50
Rails scrap	8.00	4.50
Machine shop turnings	3.00	2.50
Boiler plate	4.50	4.50
Heavy axle turnings	4.50	2.50
Cast borings	4.00	3.00
Steel borings	2.00	2.00
Wrought pipe	3.50	2.50
Steel axles	7.00	6.00
Axles wrought iron	7.00	6.5
No. 1 machinery cast	9.00	9.00
Stove plate	5.50	5.00
Standard carwheels	7.25	"
Malleable	6.75	"

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.5% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algeria	9.50c.
Iron, low phos., Swedish, average 68½% iron	9.50c.
Iron, basic or foundry, Swedish, aver. 65% iron	9c.
Iron, basic or foundry, Russian, aver. 65% iron	9c.
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48½	20c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered*	$17.50 to $18.50
Tungsten, domestic scheelite, delivered†	17.00

Per Gross Ton

Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic Seaboard	$17.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic Seaboard	20.00

*Quotations nominal in absence of sales.
†Nominal; no supplies available.

Fluorspar

Per Net Ton

Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines for all-rail shipment	$15.50 to $16.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	17.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	$15.50 to 16.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

Per Net Ton

Furnace, f.o.b. Connellsville Prompt	$3.85
Foundry, f.o.b. Connellsville Prompt	$4.60 to 5.10
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	$8.20 to 8.81
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	$9.25
Foundry, Birmingham	6.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	$1.80 to $2.05
Mine run coking coal f.o.b. W. Pa.	2.05 to 2.25
Gas coal, ¾-in. f.o.b. Pa. mines	2.25 to 2.5
Mine run gas coal f.o.b. Pa. mines	2.05 to 2.2
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.85
Gas slack, f.o.b. W. Pa. mines	1.90 to 2.10

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. del'd Chicago

No. 3 industrial fuel oil	3.88c
No. 5 industrial fuel oil	3.38c

Per Gal. f.o.b. Cleveland

No. 3 distillate	5.50c
No. 4 industrial	5.25c
No. 5 industrial	4.00c

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	45.00	40.00
New Jersey	55.00	45.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Chrome Brick

Per Net Ton

Standard size	$45.00

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	$45.00
Chicago	54.00
Birmingham	55.00
Silica clay, per ton	8.00

Magnesite Brick

Per Net Ton

Standard size, burned, f.o.b. Baltimore and Chester, Pa.	$65.00
Unburned, f.o.b. Baltimore	55.00
Imported grain magnesite, f.o.b. Baltimore and Chester, Pa.	45.00
Domestic grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.50

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	*3.45c.
Squares and flats	*3.45c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count,	65 per cent off list.
Machine bolts, 100 count,	65 per cent off list.
Carriage bolts, 100 count,	65 per cent off list.
Nuts, all styles, 100 count,	65 per cent off list.
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	*2.70
Wire, galv. soft, base per 100 lb.	*2.925
Common wire nails, per keg	*2.834
Cement coated nails, per keg	*2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
	Per Cent Off List
Machine bolts	60 and 5
Carriage bolts	60 and 5
Lag screws	60 and 5
Hot-pressed nuts, sq. tap. or blank	60 and 5
Hot-pressed nuts, hex. tap or blank	60 and 5
Hex. head cap screws	80
Cup point set screws	70 and 10
Flat head bright wood screws	37½ and 10
Spring cotters	50
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
No. 8 black ann'l'd wire per 100 lb.	$3.85
Com. wire nails, base per keg	3.05
Cement c't'd nails, base per keg	3.05

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

NEW YORK

	Base per Lb
Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.22c.
Iron bars	3.22c.
Iron bars, swed. charcoal	6.75c. to 7.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.92c.
Flats and squares	4.42c.
Cold-rolled; strip, soft and quarter hard	3.32c.
Hoops	3.52c.
Bands	3.52c.
Hot-rolled sheets (No. 10)	3.27c.
Hot-rolled ann'l'd sheets (No. 24*)	3.85c.
Galvanized sheets (No. 24*)	4.50c.
Long terne sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.25c.
Wire, galv. (No. 10)	3.85c.
Tire steel, 1 x ½ in. and larger	3.65c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21
	Per Cent Off List
Machine bolts, cut thread: All diameters	70
Carriage bolts, cut thread: All diameters	70
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.44c.
Bars, soft steel or iron	3.19c.
Cold-fin. rounds, shafting, screw stock	3.74c.
Hot-rolled annealed sheets (No. 24)	4.09c.
Galv. sheets (No. 24)	4.79c.
Hot-rolled sheets (No. 10)	3.29c.
Black corrug. sheets (No. 24)	4.09c.
*Galv. corrug. sheets	4.79c.
Structural rivets	3.99c.
Boiler rivets	4.09c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fittings up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
1000 lb. or over	70 and 10
200 to 999 lb.	67½ and 10
100 to 199 lb.	65 and 10
Less than 100 lb.	60 and 10

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.95c.
*Structural shapes	2.95c.
*Soft steel bars, small shapes, iron bars (except bands)	2.90c.
‡Reinforc. steel bars, sq. twisted and deformed	2.955c.
Cold-finished steel bars	3.75c.
*Steel hoops	3.40c.
*Steel bands, No. 12 and 3/16 in., incl.	3.15c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.55c.
†Galvanized sheets (No. 24)	4.25c.
*Hot-rolled annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforc. steel bars	*2.10c.
Cold-finished steel bars	3.40c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
Black ann'l'd wire, per 100 lb.	$2.65
No. 9 galv. wire, per 100 lb.	3.00
Com. wire nails, base per keg	2.40

*Plus mill, size and quantity extras.

†Outside delivery 10c. less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.15c.
New billet reinforc. bars	3.25c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.45c.
Cold-finished bars	3.70c.
Hot-rolled annealed sheets (No. 24)	4.00c.
Galv. sheets (No. 24)	4.70c.
Hot-rolled sheets (No. 10)	3.20c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	*$2.91
Com. wire nails, base per keg (1 to 24 kegs)	3.50
25 to 50 kegs	3.30
Larger quantities	3.10
Cement c't'd nails, base 100-lb. keg	3.50
Chain, 1-in., per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$19.03
4-in.	44.96
Lap-welded steel boiler tubes, 2-in.	18.10
4-in.	42.32

BUFFALO

	Base per Lb.
Plates	3.27c.
Struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Round and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.62c.
Galv. sheets (No. 24)	4.70c.
Bands	3.42c.
Hoops	3.42c.
Hot-rolled unannealed sheets	3.17c.
Com. wire nails, base per keg	$3.25
Black wire, base per 100 lb.	3.55c.

BOSTON

	Per Lb. Base
Beams, channels, angles, tees, zees	3.52c.
H beams and shapes	3.52c.
Plates—sheared, tank and univ. mill, ¼ in. thick and heavier	3.53c.
Floor plates, diamond pattern	5.33c.
Bar and bar shapes (mild steel)	3.30c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.60c. to 4.60c.
Half rounds, half ovals, ovals and bevels	4.55c.
Tire steel	4.55c.
Cold-finished rounds and hexagons	5.25c.
Cold-rolled strip steel	3.245c.
Cold-finished squares and flats	4.30c.
Blue annealed sheets, No. 10 gal.	3.60c.
One pass cold-rolled sheets No. 24 ga.	4.15c.
Galvanized steel sheets, No. 24 ga.	4.85c.
Lead coated sheets, No. 24 ga.	5.80c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c.
Soft steel bars	3.06c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.66c.
Cold-finished steel bars	4.36c.
Cold-rolled strip	3.30c.
Structural rivets (keg lots)	3.86c.
Boiler rivets (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.10c.
Com. wire nails	2.90c.
Cement coated nails	2.90c.
	Per Cent Off List
Machine bolts (100 pcs. and over)	65
Carriage bolts (100 pcs. and over)	65
Hot-pressed nuts, sq. and hex., tapped or blank (keg lots)	60 and 5

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 3499 lb. On cold-finished bars the prices are for orders of 300 to 499 lb.

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.55c.	3.70c.	3.55c.
Shapes, standard	3.55c.	3.70c.	3.55c.
Soft steel bars	3.60c.	3.70c.	3.60c.
Reinforcing bars	3.50c.	3.50c.	3.50c.
Hot-rolled annealed sheets (No. 24)	4.40c.	4.45c.	4.40c.
Hot-rolled sheets (No. 10)	3.75c.	3.80c.	3.75c.
Galv. sheets (No. 24)	5.00c.	5.05c.	5.00c.
Cold finished steel:			
Rounds	5.95c.	5.95c.	4.75c.
Squares and hexagons	7.20c.	7.20c.	6.00c.
Flats	7.70c.	7.70c.	7.00c.
Common wire nails —base per keg	$3.40	$3.25	$3.30

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Sheet Steel Sales Rise in December

SALES, production and shipments of sheet steel products rose sharply in December, according to the report of the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. In this survey, which is based on figures covering a monthly capacity of 325,000 tons, or approximately 59 per cent of the country's total capacity of 550,000 net tons, makers reported sales of 193,130 tons in December, compared with 133,344 tons in November; production of 159,740 tons against 143,057 tons, and shipments of 141,566 tons contrasted with 108,880 tons. Unfilled tonnage on Jan. 1 totaled 158,456 tons, or 48.8 per cent of capacity, compared with 100,745 tons, or 31.0 per cent of capacity on Dec. 1. The December report with comparisons of the two preceding months, in net tons, follows:

	Dec.	Nov.	Oct.
Sales	193,130	133,344	102,920
Production	159,740	143,057	104,898
Shipments	141,566	108,880	95,107
Unfilled orders	158,456	100,745	77,423
Unshipped orders	40,327	42,150	38,597
Unsold stocks	64,393	65,400	63,667
Capacity per month	550,000	550,000	550,000
Percentage reporting	59.0	59.0	59.0
Percentages, Based on Capacity			
Sales	59.4	41.0	31.7
Production	49.2	44.0	32.3
Shipments	43.6	33.5	29.3
Unfilled orders	48.8	31.0	23.8
Unshipped orders	12.4	13.0	11.9
Unsold stocks	19.8	20.1	19.6

To Convert Stock

UNDER a resolution of the board of directors of the United Engineering & Foundry Co. to be submitted to the stockholders for approval at the annual meeting on April 23, the common stock of the company will be changed from a no-par stock to a $5 par stock with an exchange of two shares of the new stock for one share of the old. The total proposed authorized common stock will be one million shares. There are now 416,118 shares of no-par common stock outstanding. Directors declared a dividend of $1.75 a share on the preferred, 25c. on the common, payable Feb. 8 to stockholders of record on Jan. 29.

Copper Sales Continue to Expand—Lead Strong Despite Stock Increase

Spelter Market Still Very Dull With Buying Restricted At Low Price Level—Tin Stronger Following Preceding Week's Decline

NEW YORK, Jan. 22.—Copper sales yesterday totaled about 2000 tons, one of the highest figures reported in recent months. Today's transactions will probably bring the aggregate for the month to date up to the 20,000-ton mark, compared with total December bookings of only a little more than this. An increase in activity this month was to have been expected, but business is probably running slightly ahead of conservative predictions. The Blue Eagle price is unchanged at 9c. a lb., delivered Connecticut Valley, and quotations abroad this morning were holding at about 6.90c. a lb., usual Continental base ports. The industry is noticing a somewhat general improvement, but none of the large utilities has entered the market and there seems little indication that large buying from this source will develop in the near future. The trade is awaiting with considerable interest the early visit in the United States of the head of the Katanga interests. Considerable secrecy surrounds the trip, but it is almost certain that foreign curtailment will be discussed.

Tin

The market has strengthened this week, having rallied rather steadily since the reaction earlier in the month. Spot metal is rather scarce and the price today is quotable at 51.15c. a lb., reflecting a five point decline from yesterday. Buying is by no means active, but brokers consider business fair and expect further gains. With tin plate operations approaching 65 per cent of capacity, the outlook in that important industry is very good. At London this morning spot tin was quoted at £232 5s. and futures at £228 7s. 6d., while Straits metal at Singapore was available at £232 12s. 6d. The statistical office of the International Tin Research and Development Council has estimated 1934 world production of tin at 107,700 tons, compared with 84,963 tons in 1933 and 92,908 tons in 1932. World consumption in manufacture is estimated by the same agency at 130,000 tons, against 134,000 tons in the preceding year and 106,000 tons in 1932. Tin consumption by the United States tin plate industry declined, but all other industries increased their takings.

Lead

Although December statistics were not entirely favorable, a slight increase in stocks had been anticipated, and the market remains very firm at 3.55c. a lb., St. Louis, and 3.70c., New York. Sales for January delivery are still being made, although, of course, in reduced volume. The February position is not nearly covered, as consumers are adhering closely to their policy of buying only for their immediate needs. These are quite sufficient to take care of company intake. The December increase in smelter's stocks of refined lead amounted to about 2500 tons, and shipments were 2900 tons greater than in the preceding month. The gain in output was only 2400 tons, total production having been 37,217 tons, compared with 34,425 tons in November. Stocks at the end of the month totaled 235,457 tons and were at the highest level since the beginning of August. December shipments were 34,680 tons, against 31,803 tons in the preceding month. Paint manufacturers and battery makers again lead the consuming groups and declines were registered in shipments to both cable and ammunition producers.

Zinc

The zinc market continues to be a rather dull affair, although quotations have remained rather firm at 3.75c. and 4.10c. a lb., East St. Louis and New York. Bids under these levels for January delivery have been refused. Last week's sales amounted to only about 1000 tons, compared with 4000 tons in the preceding seven-day period. The galvanizing industry seems to be more active, but such business is not being immediately reflected in the market for spelter. The concentrate market is steady at $25 a ton for the flotation grade and $26 for coarse material. Last week's output was about 7800 tons, while shipments amounted to 8500 tons.

The Week's Prices. Cents Per Pound for Early Delivery

	Jan. 16	Jan. 17	Jan. 18	Jan. 19	Jan. 21	Jan. 22
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, N. Y.	9.12½	9.12½	9.12½	9.12½	9.12½	9.12½
Straits tin, Spot, New York	50.70	50.80	50.95	....	51.20	51.15
Zinc, East St. Louis	3.75	3.75	3.75	3.75	3.75	3.75
Zinc, New York	4.10	4.10	4.10	4.10	4.10	4.10
Lead, St. Louis	3.55	3.55	3.55	3.55	3.55	3.55
Lead, New York	3.70	3.70	3.70	3.70	3.70	3.70

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, virgin 99 per cent plus, 19c. to 22c. a lb., delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 14c. a lb., average for week.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 14.50c. a lb., New York.
Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	52.50c. to 53.50c.
Tin, bar	54.50c. to 55.50c.
Copper, Lake	10.25c. to 11.00c.
Copper, electrolytic	10.00c. to 10.50c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.25c.
*Seamless brass tubes	16.00c.
*Seamless copper tubes	16.25c.
*Brass rods	12.75c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.50c. to 5.50c.
Lead, bar	5.50c. to 6.50c.
Lead, sheets	7.25c.
Antimony, Asiatic	15.50c. to 16.50c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ¼ and ½	31.00c. to 32.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	54.50c.
Tin, bar	56.50c.
Copper, Lake	10.00c.
Copper, electrolytic	10.00c.
Copper, castings	9.75c.
Zinc, slab	5.50c. to 5.75c.
Lead, American pig	4.70c. to 4.95c.
Lead, bar	7.75c.
Antimony, Asiatic	16.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	59.50c.
Solder, ½ and ½	33.00c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.50c.	6.25c.
Copper, hvy. and wire	5.37½c.	5.87½c.
Copper, light and bottoms	4.37½c.	4.87½c.
Brass, heavy	2.87½c.	3.50c.
Brass, light	2.12½c.	2.87½c.
Hvy. machine composition	4.37½c.	4.87½c.
No. 1 yel. brass turnings	3.75c.	4.25c.
No. 1 red brass or compos. turnings	4.00c.	4.50c.
Lead, heavy	2.62½c.	3.00c.
Zinc	1.87½c.	2.25c.
Cast aluminum	9.62½c.	10.75c.
Sheet aluminum	11.00c.	12.50c.

South Gets 15,000-Ton Rail Order

BIRMINGHAM, Jan. 22.—The Louisville & Nashville has bought 15,000 tons of rails from the Tennessee Coal, Iron & Railroad Co. for delivery in the first quarter. This order has been expected for several weeks, as the road's president announced on a recent visit that it was pending. Southern Pacific has sent out inquiries on approximately 26,000 tons, and the district is hopeful of securing a part of this, as in the past Southern Pacific has been a good customer of the local mill.

Other rail inquiries are said to be pending, but no definite information is available about them. The Ensley rail mill is still idle and no date has been announced for the resumption of work.

Six open-hearths were in production last week, four at Fairfield and two at Alabama City. This will likely be the same schedule during the current week.

Steel demand, other than railroad tonnage, continues about as in recent weeks, with a general run of small orders.

The pig iron market is still more or less sluggish, with spot sales largely the rule. Most foundries are still inclined to buy in close step with melt. Operations are better than the early part of December, with shipments slightly larger.

The Tennessee company has rebanked its Ensley furnace and also one of those at Fairfield, leaving it with only one active stack. This leaves a total of four active furnaces for the district, with Woodward Iron, Sloss-Sheffield, Republic Steel and the Tennessee company each having one producing furnace.

Gold Case Affects Cincinnati Trade

CINCINNATI, Jan. 22.—While having no direct bearing upon the market, the gold clause case before the Supreme Court has caused some apprehension in the trade. Demand for pig iron has been on a par with recent weeks. While the resistance of a month ago toward anticipatory buying has eased, contracts for substantial tonnages are not being made. With automobile foundries in broader operation, the district melt is heavier.

Shipments of foundry coke are at a higher rate than any time in the past two months. Domestic coke is sluggish under the influence of unseasonal weather.

District sheet mills report improved demand, largely influenced by heavier automotive ordering. Refrigerator and stove manufacturers are ordering at an unusually good rate for this time of the year. Some jobbing demand has appeared, especially for galvanized sheets. District rolling schedules for this week are estimated at close to 80 per cent of capacity output. Orders are for prompt shipment and backlogs are small.

Demand out of warehouse is tending upward under the influence of industrial buying. Some jobbers report January business about one-fifth larger than December.

Speculative activity among scrap dealers has subsided pending the court decision in the gold clause case. Mill buying is low and current business is largely to clean up old commitments. Bids are steady, but underlying softness makes current schedules nominal.

Detroit Scrap Market Is Quiet

DETROIT, Jan. 22.—The local market is relatively quiet. Although little new buying developed the past week, prices continue steady. No change in the situation is anticipated in the immediate future.

Scrap and Pig Iron Active at Buffalo

BUFFALO, Jan. 22.—Steel works operations continue at the same ratio as during last week. The Lackawanna plant of the Bethlehem Steel Corpn. is alternating between nine and ten open-hearths, with the probability that during the remainder of this week ten furnaces will be in operation. The Seneca sheet division of Bethlehem is running at 60 per cent. Republic Steel Corpn. is operating five open-hearths, and Wickwire-Spencer, one.

One of the features of the scrap market was the purchase during the past week by the leading consumer of the district of between 3500 and 4000 tons of No. 1 and No. 2 heavy melting steel at $12 and $10.50 respectively. The mill is endeavoring to obtain more material at these prices. The market is firm for all grades.

A steady improvement in the pig iron market has taken place since as long ago as last August, with the sales each week slightly better. Some sizable tonnages, running as high as 1000 tons or more, have been closed in the last two weeks. Producers' order books are larger than they have been in six months, and shipments are much improved.

The Judson Mfg. Co., Oakland, Cal., has changed its corporate name to the Judson Steel Co.

PERFORATED METALS..
FOR EVERY PURPOSE
Plain and Ornamental Perforations in a great variety of sizes and styles, made in any metal.
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PLANT EXPANSION AND EQUIPMENT BUYING

Machine Tool Demand Is Sustained At December Level—Outlook Good

DESPITE the absence of substantial buying or new inquiry from the automobile industry, demand for machine tools is holding close to the relatively high December level. Single tools predominate, and Detroit buyers are even accounting for some of this activity. This would indicate that the important automotive industry, although not undertaking any important retooling programs, is not hesitant about placing any business which would help it reduce costs.

The Transue & Williams Steel Forging Corpn., Alliance, Ohio, is considering the purchase of a number of machine tools. Orders for press equipment have been relatively heavy since the first of the year and much inquiry is outstanding.

NEW ENGLAND

Metal Products Corpn., 510 Campbell Avenue, West Haven, Conn., manufacturer of metal specialties, plans one-story addition, 30 x 110 ft. Cost over $25,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 5 for 40 3000-lb. and 20 2500-lb. stockless anchors (Schedule 4111) for Boston, Newport News, Kearny, N. J., Mare Island and Puget Sound navy yards.

Board of Selectmen, Town Hall, Framingham, Mass., is considering extensions and improvements in municipal airport, including new hangar units, shops and other structures. Cost close to $100,000 with equipment.

H. E. Zahr, Inc., Lynn, Mass., has been organized by D. E. and Herman E. Zahr, 40 Ingals Street, to manufacture commercial and other automobile bodies, and kindred products.

Union Metal Works, 80 Carter Street, Chelsea, Boston, manufacturer of brass, copper and kindred metal goods, plans rebuilding part of plant recently destroyed by fire. Loss over $60,000 with equipment.

Monarch Chemical Sprinkler Corpn., Fairfield, Conn., recently organized by John L. Seat, Fairfield, and associates, has begun erection of one-story plant on Post Road for manufacture of sprinklers and sprinkling equipment.

NORTH ATLANTIC

Superintendent of Lighthouses, St. George, Staten Island, New York, asks bids until Feb. 6 for one cylindrical cast iron lighthouse lantern, about 8 ft. diameter, with bronze helical bar sash fitted with bent plate glass, all parts machined to fit ready to assemble (Proposal 47799).

A. P. W. Paper Co., Broadway, Albany, N. Y., has plans by Johnson & Wierk, Grand Central Terminal, New York, consulting engineers, for new multi-story paper converting mill on site of present Liberty plant, and will ask bids on general contract in about 60 days. Existing mill at North Albany will be removed to new location. Cost over $400,000 with machinery.

Union Metal Furring & Lathing Corpn., New York, has been organized by George H. Heitmann, 605 Fisher Avenue, North Bergen, N. J., and associates, to manufacture metal building products.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 1 for 352,039 lb. copper-nickel-alloy condenser tubes and 21,930 lb. admiralty metal condenser tubes for Brooklyn, Charleston and other navy yards (Schedule 4419), seven water jet bilge eductors (Schedule 4108); until Feb. 5, 10 motor-driven drilling machines and spare parts (Schedule 4126) for Brooklyn, Philadelphia and Charleston navy yards.

Hudson Distilleries, Inc., Valatie, N. Y., plans addition to plant, primarily for a mechanical bottling works. Cost close to $40,000 with equipment.

Central High School District, Roxbury, N. Y., plans manual training department in new two-story and basement high school. Cost about $150,000. Financing is being arranged through Federal aid. A. O. Fullerton, 111 State Street, Albany, N. Y., is architect.

Public Works Branch, Treasury Department, Washington, plans automobile service, repair shop and garage for Federal motor trucks and cars in new postal station W, West Eighty-third Street, near Columbus Avenue, New York, for which an appropriation of $323,000 is available; also similar shop in new postal station Y, East Seventieth Street, for which allotment of $452,000 has been arranged. Bids are now being asked on both structures, first noted closing Feb. 15 and latter, Feb. 5. W. E. Reynolds, assistant director of procurement, Public Works Branch, is in charge.

Dover Tank & Stack Co., Inc., Dover, N. J., has been organized under direction of Irving Youngelson, 14 West Blackwell Street, representative, to manufacture steel tanks, stacks and kindred steel plate products.

Hudson Wholesale Grocery Co., 123 First Street, Jersey City, N. J., has plans for new one-story storage and distributing plant, about 75,000 sq. ft. floor space. Cost over $150,000 with mechanical-handling and other equipment.

Board of Education, Dunellen, N. J., plans manual training equipment in new two-story school, for which bids will be asked soon on general contract. Cost about $300,000.

Luscombe Aircraft Corpn., Municipal Airport, Kansas City, Mo., manufacturer of fabricated metal cabin planes, military planes, parts, etc., plans removal of plant in February to Mercer Airport, Trenton, N. J., where one-story hangar, 80 x 100 ft., was recently leased for new plant, for parts production and assembling. Donald A. Luscombe and Reginald L. Brooks are heads.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 1 for one motor-driven precision bench lathe (Schedule 4145), one motor-driven radial drill (Schedule 4150); until Feb. 5, 200 manifold aircraft pressure gages (Schedule 4123), 600 aircraft thermometers (Schedule 4124) for Philadelphia Navy Yard; propeller shaft revolution indicators and counters and spare parts (Schedule 4110) for Philadelphia, Norfolk, Mare Island and other navy yards.

Sun Oil Co., 1608 Walnut Street, Philadelphia, has asked bids on general contract for new bulk oil storage and distributing plant at Cincinnati, with steel tanks, pumping station and lubricating oil building; also for automobile service, repair and garage building for company motor trucks and cars. Cost close to $100,000 with equipment. Cincinnati office is at 1241 Chase Street, G. B. Wreith, manager.

WESTERN PA. DISTRICT

A. Overholt & Son, Inc., Bradford, Pa., a subsidiary of National Distillers Corpn., plans early call for bids for two additions to distillery, 66 x 100 ft. and 75 x 150 ft., both seven stories, for storage and distribution. Cost over $160,000 with mechanical-handling, loading and other equipment.

Bertha Coal Co., Chamber of Commerce Building, Pittsburgh, plans rebuilding tipple at coal-mining plant at Rachel, W. Va., recently destroyed by fire. Loss over $75,000 with equipment.

Otis Mfg. Co., Chester, W. Va., manufacturer of roofing and building papers and kindred products, plans extensions and improvements, including department for manufacture of a new specialty. Cost about $30,000.

Frozen Carbonic Co., Neville Island, Pittsburgh, has let general contract to J. M. Baldwin, 1000 Macon Avenue, for new one-story dry-ice manufacturing plant. Cost about $60,000 with equipment.

BUFFALO DISTRICT

Frederic B. Stevens, Inc., Third and Larned Streets, Detroit, manufacturer of foundry facings and supplies, has acquired plant of Columbian Facing Mills Co., 93 Stone Street, Buffalo, for new branch factory. Plant at Erie, Pa., will be removed to new location and capacity increased. Department will also be established at Buffalo plant for manufacture of platers' equipment and supplies. C. J. Menzemer, heretofore branch manager at Erie, will be in charge at Buffalo.

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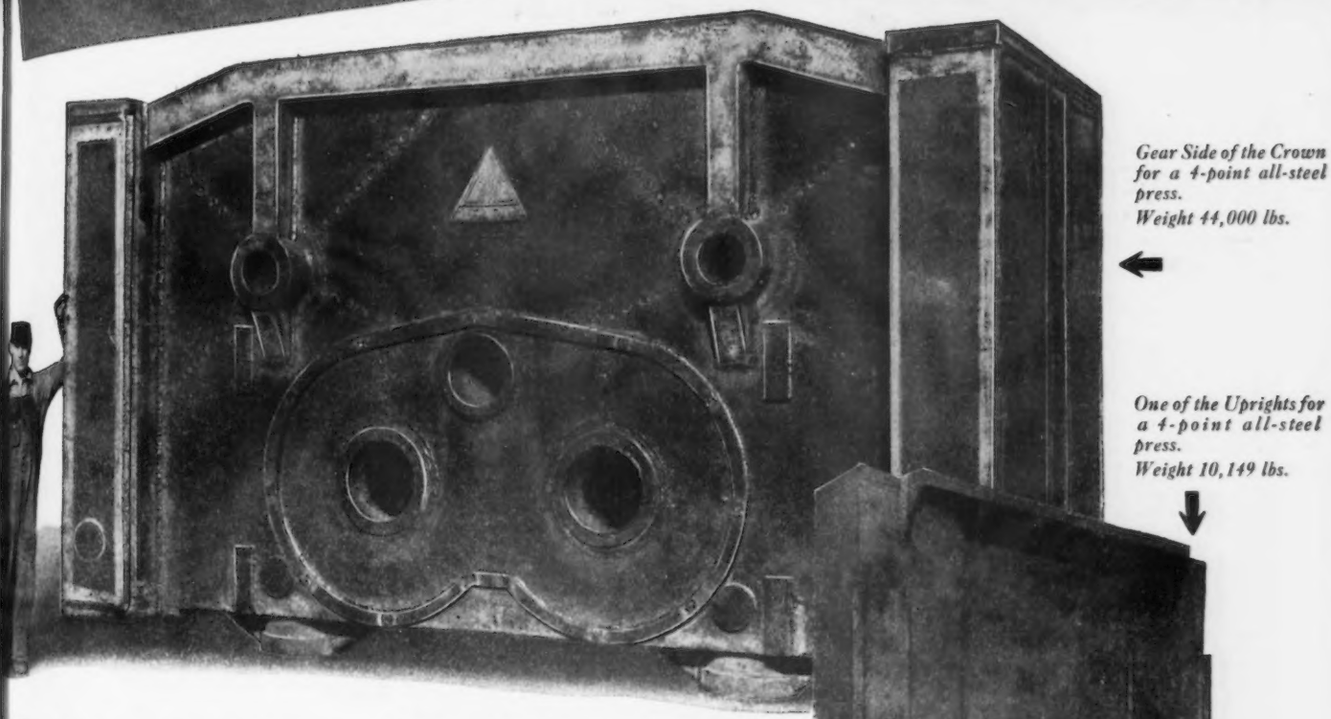
FOR THE *Mechanical Industries*



Gear Side of the Crown for a 4-point all-steel press.
Weight 44,000 lbs.

One of the Uprights for a 4-point all-steel press.
Weight 10,149 lbs.

This high production, heavy duty, automotive press, manufactured by the Clearing Machine Corporation, was fabricated from base up by Danly-Smithwelding... Shown here are some of the parts that go to make up this press, produced by this modern method of steel construction . . .

Complete and virtually unlimited facilities of the A. O. Smith Corporation, long a leader in the fusion welding field, with the exclusive Smithwelding process . . . and the Danly Machine Specialties, Inc. . . . a specialized producer in the machinery and welding fields.

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Animal Trap Co. of America, Inc., Lititz, Pa., manufacturer of steel and iron animal traps, etc., has plans by Findlay & Mann, Niagara Falls, Ont., architects, for two-story addition to branch plant at Niagara Falls, 80 x 140 ft. Cost close to $50,000 with equipment.

Canadian Acme Screw & Gear, Ltd., 1209 King Street, West Toronto, has purchased portion of former plant of Willys-Overland Co., West Toronto, totaling about 190,000 sq. ft. floor space. Present works will be removed to new location in spring and increased capacity arranged.

SOUTH ATLANTIC

Marquette Mfg. Co., Minneapolis, Minn., manufacturer of automotive equipment, tools, etc., is planning establishment of factory branch, storage and distributing plant at Greensboro, N. C. Several other branch plants are being considered in South, including Atlanta, Ga., and Richmond, Va.

Standard Oil Co. of New Jersey, Charleston, S. C., has approved plans for extensions and improvements in bulk oil storage and distributing plant, including new dock, tank units, loading and other facilities. Asphalt plant will be modernized and new equipment installed. Cost over $125,000 with machinery. Headquarters are at 26 Broadway, New York.

Lutz Dowel Works, Statesville, N. C., has authorized installation of new machinery, including wood-turning machinery for production of dowel pins, buckles and kindred specialties.

J. N. Dececco, Vienna, Md., operating a food products canning plant, plans new branch factory at Glenville, Ga., with power house. Cost over $45,000 with equipment.

SOUTH CENTRAL

George T. Stagg Co., Frankfort, Ky., has awarded general contract to Frank Messer & Sons, Inc., 2515 Burnet Avenue, Cincinnati, for seven-story addition to distilling plant, for storage and distribution. Cost over $100,000 with equipment. Carl J. Kiefer, Schmidt Building, Cincinnati, is consulting engineer.

Plough, Inc., Memphis, Tenn., manufacturer of chemical products, has engaged Arthur L. Nelson Engineers, Inc., 31 St. James Avenue, Boston, to make surveys and plans for new multi-unit plant at East Parkway and line of Southern Railway. Cost over $500,000 with equipment.

City Council, Knoxville, Tenn., has let general contract to Hess & Barton, Jones Law Building, Pittsburgh, Pa., for first unit of municipal electrical distribution system in Northeastern district at $197,575, comprising about one-fourth of total system. Bids for remainder of installation will be asked at once. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Hatfield Campbell Creek Coal Co., Union Trust Building, Cincinnati, plans new coal-handling and unloading plant, with tramway system, at Maysville, Ky., on Ohio River.

City Council, Florence, Ala., in conjunction with councils at Tuscumbia and Sheffield, Ala., acting jointly, will soon take bids for new municipal electrical distribution systems for three municipalities noted. Fund of $796,000 has been secured through Federal aid for entire project, including transmission lines, substations and other structures. Lee Glenn, mayor, Florence, is active in enterprise.

SOUTHWEST

Liquid Carbonic Co., 2000 Baltimore Avenue, Kansas City, Mo., has let general contract to Kaiser-Ducett Co., Davidson Building, for multi-story dry-ice manufacturing plant, 130 x 200 ft. Cost close to $200,000 with equipment. Company headquarters are at Chicago. Frank C. Becker is manager at Kansas City.

City Council, Anderson, Mo., has approved bond issue of $55,000 for initial unit of new municipal hydroelectric generating plant. Albert C. Moore, Joplin, Mo., is consulting engineer.

Edwards Chevrolet Co., 6820 Gravois Avenue, St. Louis, local representative for Chevrolet automobiles, has leased new one-story and basement building, 60 x 80 ft., and 25 x 65 ft., on Kingshighway, for which superstructure will soon begin. A machine shop will be installed. Cost over $50,000 with equipment. W. P. McMahon, 411 Butler Street, is architect.

City Council, Burlington, Kan., has secured permission for new municipal electric light and power plant. Fund of $145,000 will be secured through Federal aid, including municipal distribution system. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

Board of Public Works, Oklahoma City, Okla., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for extensions and improvements in municipal waterworks. Bond issue of $350,000 has been authorized at special election.

General American Transportation System, Inc., 230 South Clark Street, Chicago, affiliated with General American Tank Car Corpn., same address, plans new bulk oil storage and distributing terminal on 50-acre tract on ship channel, Houston, Tex., comprising battery of steel tanks, pumping plant, pipe line facilities and group of buildings. Cost over $500,000 with equipment. Company is also planning enlargements in bulk oil terminal at Corpus Christi, Tex., to double present capacity. Cost about $150,000 with equipment.

Union Machine Works, Inc., Fort Worth, Tex., has been organized by Leon L. Sanders and George C. Street, Fort Worth, to manufacture machinery and parts, and operate a general machine repair works.

WASHINGTON DISTRICT

Bureau of Supply, Treasury Department, Washington, asks bids until Jan. 28 for five electric lift trucks (Proposal 416 SP).

American Medicinal Spirits Corpn., Russell and Alluvion Streets, Baltimore, has plans for three-story and basement addition, 83 x 120 ft., for storage and distribution. Cost close to $50,000 with equipment.

General Purchasing Officer, Panama Canal, Washington, asks bids until Jan. 30 for main propelling equipment for Diesel-electric tugs (Schedule 3018); until Feb. 4, 8000 ft. rigid steel conduit, steel machine bolts, nuts, rivets, expansion shields, reflectors, 30,000 ft. copper-covered steel wire, 150,000 ft. copper wire, 100 watt-hour meters, 12 panel boards, etc. (Schedule 3025).

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for motor-driven, centrifugal ash-sluicing pump, with pipe line, wiring, etc., at local navy yard (Specification 7836).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 29 for 20 aircraft propellers (Schedule 4116), metal furniture (Schedule 3916); until Feb. 5, air pressure reducing valves, relief valves and pressure gages (Schedule 4139), light and power shore use cable (Schedule 4122) for Eastern and Western navy yards.

MICHIGAN DISTRICT

Modern Brewing Co., Grand Rapids, Mich., has plans for new multi-story plant. Cost about $100,000 with equipment. George Fuchs is company architect.

Cayo Mfg. Co., Benton Harbor, Mich., Julius N. Cayo, president, has taken over former building of Versaw Storage Co. for production of toy airplanes and parts. Company will absorb this branch of business of Donald F. Duncan, Inc., 1500 South Western Avenue, Chicago, including certain equipment to be installed in Benton Harbor plant. Facilities will be provided for initial output of about 10,000 plane units per day.

Grand Trunk Western Railroad Co., Port Huron, Mich., plans rebuilding part of local car repair shops recently destroyed by fire. Loss close to $100,000 with equipment.

Henze Mfg. Co., Detroit, has been organized by Paul Henze, 280 Harmon Avenue, and associates, to manufacture mechanical equipment and devices.

Reid Products Co., Marine City, Mich., manufacturer of automotive specialties, slides for car windows, etc., has begun one-story addition to double present capacity. Cost close to $30,000 with equipment. Main plant of company is at Cleveland.

Carl E. Swift Corpn., Holland, Mich., has been organized to manufacture electric washing machines and other appliances. Officers are: Carl E. Swift, president; E. G. Landwehr, vice-president and treasurer; Henry L. Stimson, secretary; Frank E. Stearns, works manager.

OHIO AND INDIANA

Bissett Steel Co., 945 East Sixty-seventh Street, Cleveland, distributer of steel and iron products, plans one-story addition, 60 x 90 ft., for storage and distribution.

William Dennick Brass Foundry, Inc., Dayton, Ohio, has been organized by William C. Dennick and John W. Dale, 1040 Reibold Building, to manufacture brass, bronze and kindred metal castings.

Gummed Products Co., Troy, Ohio, manufacturer of gummed paper products, will soon take bids on general contract for one-story

WORLD'S GREATEST BRIDGE .. *in the making*

EAST and West of its pivot on Yerba Buena Island simultaneously proceeds the erection of the San Francisco - Oakland Bay Bridge — a double deck structure which, with its approaches, will measure 8¼ miles in length. Many of the riveted spans of the east crossing are now in place; and of the four steel towers that will support the twin suspension spans of the west crossing, three are already completed.

This greatest of bridges—greatest in depth of piers, greatest in length, greatest in tunnel bore at the island—also establishes a record for the largest steel order ever placed under one contract. Of the total—some 180,000 tons—about 18,000 tons represent steel wire for the cables that are to support the floors of the twin suspension spans.

All structural steel is to be fabricated and erected by American Bridge Company. The Columbia Steel Company, also a subsidiary of United States Steel Corporation, has the general contract for the entire steel superstructure.

Other United States Steel Corporation subsidiaries contributing their products to this gigantic project are Carnegie Steel Company, Illinois Steel Company, American Steel & Wire Company, National Tube Company, and The Lorain Steel Company.

AMERICAN BRIDGE COMPANY

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

General Office: Frick Building, Pittsburgh, Pennsylvania

Contracting Offices: Baltimore, Boston, Chicago, Cincinnati, Cleveland, Denver, Detroit, Duluth, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Salt Lake City.

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco *Export Distributors:* United States Steel Products Company, New York

addition, including power house. Work will be carried out in connection with expansion and improvements now under way. Cost over $200,000 with machinery. John H. Deeken, Times-Star Building, Cincinnati, is architect.

Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Jan. 28 for flexible aluminum tubing (Circular 425); until Jan. 30, steel boiler tubing, tees, elbows, gaskets and other fittings, bolts, nuts, etc. (Circular 428); until Feb. 1, 452 landing lamp assemblies (Circular 431); until Feb. 5, 2250 ball-bearing rod end assemblies (Circular 430).

Crystal Tissue Co., Middletown, Ohio, manufacturer of tissue papers, waxed and other processed paper stocks, has plans for extensions and improvements, including equipment. A new water tank will be installed for service at mill. Cost about $50,000. Z. W. Ranck is president and general manager.

Stutz Motor Car Co., 1002 North Capital Avenue, Indianapolis, has arranged for loan of $300,000 with RFC, fund to be used for working capital and production, including improvements in equipment, purchase of raw materials, etc.

Board of Education, Hammond, Ind., plans manual training department in new two-story and basement high school for which bids have been asked on general contract. Cost about $600,000. James T. Hutton & Sons, 5031 Homan Avenue, are architects.

MIDDLE WEST

Mills Novelty Co., 4110 West Fullerton Avenue, Chicago, manufacturer of coin-operating machines and parts, has let general contract to A. S. Low, 510 North Dearborn Street, for new four-story plant unit, 62 x 200 ft. Cost about $100,000 with equipment. W. H. Farnum, 510 North Dearborn Street, is architect.

Kankakee Foundry Co., Inc., 2190 West Station Street, Kankakee, Ill., has been organized by F. A. and Edward C. Schneider, to manufacture metal castings.

City Council, Morris, Minn., asks bids until Jan. 29 for new municipal electric light and power plant, including station building, generating machinery and auxiliary equipment, electrical distribution system, etc. Fund of $188,000 has been arranged through Federal aid. Burlingame & Hitchcock, Sexton Building, Minneapolis, Minn., are consulting engineers; J. A. Mielke is city engineer.

Penick & Ford, Ltd., First Street, Cedar Rapids, Iowa, manufacturer of cereals, has let general contract to John S. Metcalf Co., 105 West Adams Street, Chicago, engineer, for new grain elevator. Cost about $175,000 with elevating, conveying, screening and other equipment.

Minneapolis-Honeywell Regulator Co., 2727 Fourth Avenue South, Minneapolis, Minn., manufacturer of heat regulators and allied equipment, has tentative plans for one-story addition. Cost over $50,000 with equipment. Bard & Vanderbilt, Builders' Exchange, are architects.

Firestone Tire & Rubber Co., Sixteenth Street and Wabash Avenue, Chicago, with main plant at Akron, Ohio, has filed plans for new one-story factory branch, storage and distributing plant, 104 x 140 ft., at East Seventy-first Street and Constance Avenue. Cost about $50,000 with equipment. R. W. Droegmyer, 6655 Sauganash Avenue, is architect.

Department of Light and Water, City Hall, New Ulm, Minn., will soon take bids for ash-handling equipment at municipal electric light and power plant. Carl W. Franks, City Hall, is city engineer in charge.

Mackie-Thompson Co., Room 1648, 228 North La Salle Street, Chicago, has been organized by N. S. Mackie and H. A. Thompson, to manufacture machinery and parts.

Minnesota Mining & Mfg. Co., 791 Forest Street, St. Paul, Minn., has engaged Totz, King & Day, Inc., 1509 Pioneer Building, to design new construction costing $250,000 at quartzite mining and processing plant at Wausau, Wis., including new head house with conveying equipment, belt elevators, etc., and storage building, 30 x 300 ft., with 200 one-car steel binds. Work will begin about March 15.

PACIFIC COAST

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for one 40-ton outdoor electric-operated gantry crane and runway at Mare Island, Cal., navy yard (Specification 7855).

National Park Service, 409 Underwood Building, San Francisco, plans extensions and improvements in hydroelectric generating plants on Panther and Indian creeks, near Mammoth Hot Springs, Yellowstone National Park, Wyo., including new equipment. Appropriation of $237,000 is available. Superintendent's office is at Gardiner, Mont.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 1 for four motor-driven engine lathes for Puget Sound Navy Yard (Schedule 4109); until Feb. 5, two exhaust gas-heated evaporators and spare parts for Mare Island yard (Schedule 4133).

George Caswell Co., 442 Second Street, San Francisco, manufacturer of edible oils and other food products, has let general contract to Cahill Brothers, 206 Sansome Street, for new four-story plant. Cost about $150,000 with equipment. Masten & Hurd, 233 Post Street, are architects.

Bureau of Reclamation, Denver, asks bids until Feb. 4 for aluminum or galvanized steel rolling doors, or vertical folding and swing doors for Boulder Dam power plant and appurtenant works, Boulder Canyon project, California - Nevada - Arizona (Specification 651-D); until Feb. 7, one 7½-ton capacity motor-operated traveling crane for Government warehouse, Grand Coulee Dam, Columbia Basin project, Wash. (Specification 653-D).

Board of Education, Long Beach, Cal., has approved plans for new vocational training shops at Jefferson junior high school. Cost over $35,000 with equipment. Warren A. Dedrick, 901 Heartwell Building, is architect.

Libby, McNeil & Libby, Portland and Union Stock Yards, Chicago, food canners and meat packers, are planning new canning plant at Walla Walla, Wash., with power house. Cost over $150,000 including machinery. G. B. Kile, Portland, is Pacific Northwest manager.

Idaho Meat Producers, Inc., Caldwell, Idaho, has plans for new abattoir and meat packing plant, scheduled to be ready for service early in spring. Cost close to $200,000 with equipment. Charles F. Kamrath is construction superintendent in charge.

FOREIGN

Stores Division, Posts and Telegraph Department, Wellington, New Zealand, asks bids until Feb. 21 for about 200 miles of insulated copper and other wire; until March 4, about 50,000 large insulated galvanized steel spindles and 10,000 bolt arms, fittings, etc.

Phoenicia, Ltd., Jerusalem, Palestine, recently organized, plans new plant at Haifa, in harbor district, for production of sheet glass, with power house and machine shop. Cost about $150,000 with equipment.

Compania Mexicana de Focos, S. A., Monterrey, N. L., Mexico, Guillermo Zambrano, president, recently organized, has approved plans for new works for manufacture of electric lamps. Cost over $75,000 with equipment.

Ministry of Industry, Chinese Nanking Government, Canton, China, has authorized financing in amount of $10,000,000, fund to be used for new iron and steel plant near Canton. It is proposed to purchase majority of machinery in United States under direction of Arthur G. McKee & Co., Cleveland, engineers, who will also be in charge of construction.

Lohgan Selluloosa, O. Y., Kotka, Finland, has plans for new pulp mill for paper production, and will soon ask bids for equipment. Cost over $125,000 with machinery.

Municipal Council, Dublin, Ireland, Alfred Byrne, Lord Mayor, plans new hydroelectric generating plant in Liffey Valley, for light and power for city. Cost about $250,000 with transmission system. Project will be carried out in cooperation with Shannon Scheme Board.

The name of the Gilby Wire Co., Newark, N. J., has been changed to the Wilbur B. Driver Co.

TRADE NOTES

General Refractories Co., Philadelphia, has appointed George F. Motter's Sons Supply Co., York, Pa., as dealer-agents in the York area. Company will carry complete stock of refractories in addition to mill supplies.

Palmer-Bee Co., Detroit, manufacturer of conveying machinery, speed reducers, and power transmission machinery, has appointed Special Equipment Co., 155 North Clark Street, Chicago, with branch office in Cincinnati, as district distributer of its entire line in the territories covered by the two offices.

Foote Brothers Gear & Machine Co., Chicago, has appointed C. A. Hayward as sales and engineering representative for IXL speed reducers and gearing in Detroit territory, with headquarters at 7310 Woodward Avenue. Attention is drawn to the fact that G. W. Craighead, former representative, although connected with a company of similar name, does not represent the IXL organization.

General Refractories Co., Philadelphia, has appointed Patton Clay Mfg. Co., Syracuse, N. Y., as dealer-agents in the Syracuse area. Company will carry complete stock of refractories in addition to building materials.

Ohio Power Shovel Co., wholly owned subsidiary of the Lima Locomotive Works, Inc., has been consolidated with parent company. All business in the future which involves Lima shovels, draglines and cranes will be handled directly by the Lima company's shovel and crane division. No change will be made in personnel of the organization.

Revere Copper & Brass, Inc., New York, has opened an office at 1010 Pine Street, St. Louis, in charge of Edward A. Harbeck as district manager.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Dec. 18 for four centrifugal type motor-driven pumps and spare parts (Schedule 3922) for Puget Sound Navy Yard.

New Jersey Zinc Sales Co., New York, has purchased business and good-will of David Randall & Co., and will continue this business in the name of the New Jersey Zinc Sales Co. Until further notice the company will operate from the same Boston address, 55 Kilby Street, and through the same Boston warehouse, the Albany Terminal Stores. George W. Harragan will continue as New England representative.

Janney-Semple-Hill & Co., wholesale hardware and mill goods, Minneapolis, has been appointed distributer for the industrial products manufactured by Henry Disston & Sons, Inc., Philadelphia.

Fulton Supply Co., 342 Nelson Street, S. W., Atlanta, Ga., has been appointed Southern sales representative for William Jessop & Sons, Inc., New York. The Atlanta warehouse is carrying a complete stock of Jessop's Sheffield tool and die steel.

Machinery & Welder Corpn., 312 North Sheldon Street, Chicago, with a branch office in Milwaukee, has been appointed by Medart Co., St. Louis, as representative and distributer for power transmission equipment in northern Illinois, northern Indiana and southern Wisconsin.

E. W. Buschman Co., 626 Broadway, Cincinnati, has been appointed authorized distributer of Link-Belt Co. for that territory.

Bryant Machinery & Engineering Co., Chicago, has been appointed exclusive agent for De Vlieg Milling Machine Co. in the Chicago and St. Louis territories.

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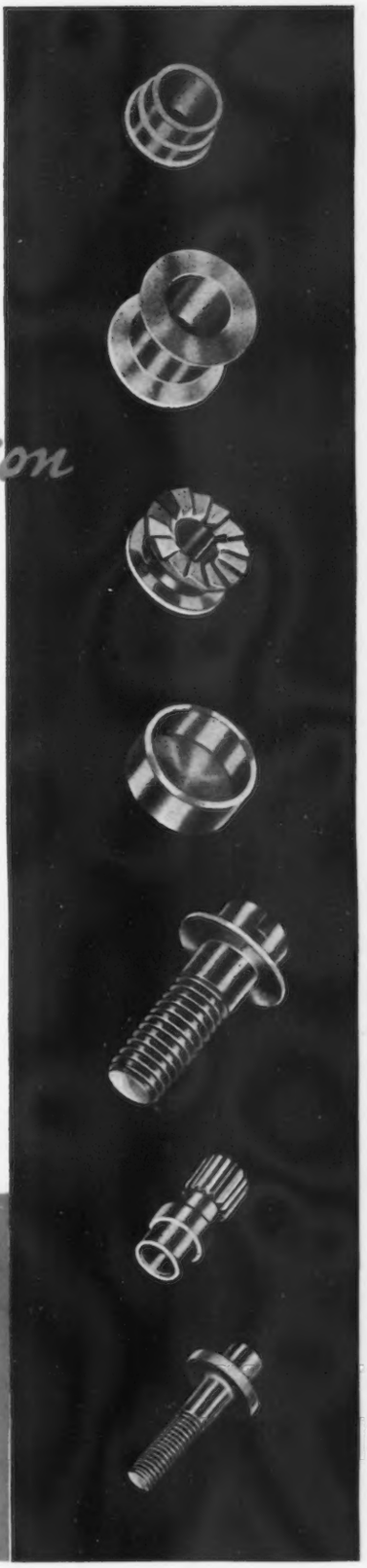

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9/16" Round, Cold Drawn
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Sulphur Bessemer Screw Steel

42.8%
Production Increase
3/4" Round, Cold Drawn
J & L Improved, S.A.E. 1112

38.5%
Production Increase
1 1/16" Round, Cold
Drawn J & L Improved
Special High Sulphur
Bessemer Screw Steel

20%
Production Increase
3/4" Round, Cold Drawn
J & L Improved
S.A.E. 1112

18%
Production Increase
3/4" Round, Cold Drawn
J & L Improved
S.A.E. 1112

11%
Production Increase
3/8" Round, Cold Drawn
J & L Improved Special High
Sulphur Bessemer Screw Steel

5%
Production Increase
1/2" Round, Cold Drawn
J & L Improved
S.A.E. 1112

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Canadian Representatives: JONES & LAUGHLIN STEEL PRODUCTS COMPANY, Pittsburgh, Pa., U. S. A., and Toronto, Ont., Canada

Cutting Set-Up Time On Assembly Fixtures

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orbit of the handle being about twice the diameter of the clamping bar orbit. The location of the pivoting points of these two orbits, in relation to each other, is a factor in design; the speed of the bar and the travel of the handle being in direct relation to all of these points. The bearings must be without excessive play, because, owing to the leverage principles of construction, looseness is amplified considerably at the pressure end of the bar. As to bearings, it can be said that from comparative tests, over a long period of usage, it has been determined that hard bronze bushings stand up better under the compressive and shearing stresses induced by the action of bar when exerting pressure. The bushing acts also as a spacer and is stationary, the members rotating around it.

One point of considerable shop trouble, when fitting the assembled clamp to the fixture or device, is that adjustments are required after all parts are screws and doweled. This may be due to spring-back of the part or to error in layout; a simple remedy is a stud bolt with a nut on each side of a separate bracket; the bracket held in place on the toggle-bar by friction until parts are lined up, at which time it is welded to the toggle-bar in determined positon, as shown by illustration A.

The toggle clamp, illustration B, combines the cumulative experience of tool shops in this vicinity and extending over a period of years. As shown in the illustration, movement of the handle through 80 deg. results in bar moving through a 160 deg. arc.

At first glance, it would appear that mechanical advantage is in favor of the toggle-bar because of its longer motion. This, however, is not so; a glance at the diagram will show 70 per cent of the travel of the handle to be comparatively without effort, because it is merely traveling to the work. The bar, for this period, travels approximately three times as fast as the handle; from this point on, the handle travels increasingly faster than the bar. At the final 5 deg. of travel, the mechanical advantage is 12 to 1. To obtain the combination of speed and power, the pivot point of toggle-bar must be on a line with or above point marked X in illustration B. This design, with the links on the outside and the location of pivot points as on clamp shown, gives all the advantage of equal or greater pressure at the toggle-bar, plus the very important advantage of full clearance of the hold-down point from the work, when open, with only a short movement of the handle. The toggle-clamp, illustration B, is a clean-cut stamping job all the way through. It is well engineered and gives high compressive and tensile values, yet has the advantages of being light in weight and durable. It will help to cut set-up time on assembly fixtures of all sizes and for every factory.

Editor's Note: This is a series of observations which, strangely enough, are exactly what they purport to be. In other words, they come from the daily diary of a real boss: a prominent executive in the metal-working industry who prefers to remain an anonymous author.

The Boss's Diary

The bigness of little things! I belong to the local unit of an internationally prominent service club. The other day I dropped in on the noon-day luncheon of this same club in a nearby city. I was received graciously enough. I wandered into the dining room and, to avoid breaking up a possible group, chose a seat at the end of the table. On my right sat the Superintendent of the public schools, on my left was a judge of one of the courts. I don't remember a word of their conversation, but I do remember that I had to ask to have the salt passed to me, I had to ask for the sugar, I asked for the cream, I SOS'd for the butter. When it came to the rolls, neighboring the judge's left elbow, I took one despairing look at them and muttered "to heck with 'em!"

Maybe it's a good city, possibly it's a lively club, but I, unfortunately, retain a mental picture of its inhospitable salt, sugar, cream, butter and rolls. Picayune of me probably, but I have no appetite to revisit them unless it is to give them a lecture on the subject—"There are 100,000 pennies in $1,000."

The Westinghouse Electric & Mfg. Co. has declared a dividend consisting of ¼ share of common stock of Radio Corpn. of America for each share of preferred stock and common stock of the Westinghouse company, such dividend to be payable Feb. 18 to stockholders of record on Jan. 21. In view of the preferential right of the preferred stock of the Westinghouse company, the board of directors has also declared an optional dividend of $3.50 per share upon any share of the company's preferred stock, the holders of which may desire to accept such cash dividend in exchange for the ¼ share of common stock of the Radio corporation to be distributed as a dividend upon said share of preferred stock. This dividend, including optional feature, constitutes as to holders of preferred stock of the Westinghouse Company full payment of the preferential dividend for 1935 to which holders of such preferred stock are entitled.